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ABSTRACT

This curriculum guide for kindergarten has a format that is highly readable and easy for a teacher to use. For each area of the curriculum (math, language arts, science, social science, and art) specific objectives and accompanying activities are provided. Detailed directions help the teacher enable children to get the maximum benefit from each activity. Methods of evaluating pupil progress, a list of useful materials and equipment, and a bibliography are also included in the guide. (DR)

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Kindergarten Curriculum Guide

Model Kindergarten Grant
P. L. 89-10 Title III

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Statement of Philosophy

Focus of kindergarten education has become an increasingly controversial issue as greater attention and emphasis is being given to early childhood education. At one end of the continuum persons with "child development" backgrounds have emphasized the physical, emotional, and social needs of the five-year-old—at times appending their intellectual needs. Curriculum, however, was based primarily on those three aspects of development and emerged solely from the interests of the child. At the other extremity content-oriented persons developed very structured curriculum within a formal climate without recognition of the basic physical, emotional, and social requirements of the five-year-old.

Weaknesses of either approach are readily apparent. In the former, the child himself determined the curriculum and long-term goals were held to a minimum. The emergent curriculum was based solely upon the child's interests and discoveries and often resulted in isolated learnings which bore little relation to the demands of the society. The latter approach failed to recognize that basic need satisfaction is prerequisite to successful learning. Small children were expected to concentrate for long periods of time on paper, pencil, and workbook activities which were incompatible with their developmental level. Lack of understanding of the implications of research into the cognitive processes of young children led again to the learning of isolated facts, but this time in a highly structured, teacher-directed approach.

Amherst's kindergarten program, as described in the proposal for the federal grant, is a "readiness" kindergarten, but its program fits neither of the above descriptions. Physical, social, and emotional needs are recognized as being of ex-

treme importance in the establishment of climate and the development of curriculum. Recognition is given to the fact that prerequisite to any design of appropriate curriculum is the study of the child himself. When his basic needs are met, exploration of intellectual content occurs. Key concepts form the basis of curriculum. Pupils are guided in the sorting and classification of information and the integration and application of concepts to new situations. Increasing competence in communication skills are stressed in all aspects of the program.

Teacher selection is a crucial matter. With the exception of the parent-child relationship, few others are as close as those between the child and his kindergarten teacher. Few people will be as influential in shaping his attitudes. Few will be as intimately associated with his need satisfaction. The teacher must be able to establish, alter, and re-establish individual pupil goals as ongoing evaluation occurs in the classroom.

Provision for health and dental examinations is essential both for diagnosis and remediation of problems already existing, as well as for prevention of future difficulties. The kindergarten teacher must be alert to symptoms of physical difficulties—to signs of poor nutrition, faulty vision and hearing, lack of sufficient sleep, or other unsatisfactory physical condition.

Although the five-year-old is extremely active, he tires easily. Provision for alternating periods of activity and relaxation provide a rhythmic program compatible with this need.

The kindergarten child often lacks good muscular or eye-hand coordination. Large muscles are better developed than the small. Opportunity for vigorous body movement—for running, crawling, jumping, tumbling—are provided. A variety of interesting manipulative materials encourages small muscle development.

Although the five-year-old usually has developed dominance, left-right directionality and perception of position in space are often lacking. These orientation skills are stressed in the perceptual aspects of the reading readiness and physical education program as well as in other areas of curriculum.

The kindergarten child maintains strong maternal ties. Separation from the security of familiar surroundings is a tremendous step for him on the road to independence. The social science curriculum clarifies his role in the family and in the classroom and interrelates the two environments. Opportunity is provided to compare and contrast home and school in terms of adult and peer contacts, physical facilities, and behavioral expectations in order to facilitate the transition.

The perceptive kindergarten teacher assists the child in identifying his emotions and provides experiences for helping him express his feelings in personally satisfying and socially acceptable ways. The five-year-old is egocentric—a beginner in social learning. Essential to peer group acceptance is the ability to share in work and play situations. Assistance in recognizing the feelings of others is needed as he emerges as a social being.

Because a realistically positive self-concept is vital to successful functioning in any situation, the kindergartner must find all learning experiences so structured as to minimize failure. Unique contributions of every child are recognized and reinforced.

Natural curiosity so evident in the young child is encouraged by the methodology employed in the kindergarten program. While behavioral limits are identified, the child is provided with multiple opportunities within this framework to move about the classroom, to manipulate materials, to test ideas, to apply concepts.

Discussions, dramatic play, role-playing, choral speaking and free play periods provide many and varied activities for increasing verbal competency..

The integrated, basic concept approach to content areas is similar to that proposed by Helen Robison and Bernard Spodek and is a departure from both the child-centered and the rigidly teacher-structured approach. "Instead of taking children on loosely-planned trips to encourage as-yet-undefined learning, the teacher will now be encouraged to plan a trip because of some specific data she wishes the children to perceive or experience, in order to build a base for the concept she wants them to construct. The children's active involvement in manipulative, exploratory, and varying experiences would be a major learning avenue with strong emphasis upon play and individual choice. To this, the teacher would add stimulating and suggestive materials, direction, support, verbalization, clarification, practice activities and interaction." [1]

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[1] Robison and Spodek: *New Directions in the Kindergarten.* Teachers College Press, Columbia University, New York: 1965

Recognition is given to the fact that the depth of experience and understanding varies tremendously from pupil to pupil. The climate and methodology lend themselves to acceptance and, indeed, encouragement of this diversity. Bruner, when proposing the spiral nature of curriculum suggested that any concept could be offered to any child of any age in an intellectually sound manner. Acceptance of spiral concepts in curriculum removes the need for fixed levels of achievement or strict grade placement of content, as it provides for return again and again to basic concepts, each time adding a measure of sophistication.[2]

The intent of this booklet is not to provide the kindergarten teacher with a step-by-step recipe-type manual. No person apart from the kindergarten teacher herself in a specific classroom is capable of that refinement. For only she knows what happened in yesterday's class, what new interests were sparked, what exciting questions were asked and what tangents might have been taken. She knows that whatever is taught in kindergarten must not be taught at the expense of unplanned and spontaneous exploration ignited by pupil interest or curiosity. The function of this guide is to delineate key concepts and to suggest some activities which seem to be appropriate in meeting the broad objectives of the program.

Division of content into subject areas is a convenience of format only. Application of concepts developed in a given content area should be made in other areas of curriculum as well as in meaningful social situations. The booklet is an invitation to the kindergarten teacher to use and to evaluate its contents and to add her own creative activities as they are tested in the classroom situation.

It is our hope that "the kindergarten will grow in nature as our vision and our insight into the meaning of education deepen and broaden. It will be altered from year to year by reflection upon what we have attempted and what we have accomplished. Out of this will come a new vision, a higher standard, which will enable us to reconstruct and create newer and more ideal courses of study for children of the future." [3]

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[2] Bruner: *On Knowing.* Belknap Press of Harvard University, Cambridge, Mass.: 1963

[3] Patty Snich Hill: *Second Report — The Kindergarten.* Houghton Mifflin, Boston, Mass.: 1913

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Objectives of Kindergarten Program

Physical
- to increase strength and endurance
- to improve muscular coordination
- to respond rhythmically
- to utilize correct body mechanics in daily activities
- to recognize and experience total relaxation and release from tension
- to control bodily functions
- to identify need for proper food, habits of cleanliness, proper amount of sleep
- to use rules necessary for safety

Emotional
- to establish a positive self-concept
- to establish the following sequential levels of personality development
  - a. to develop sense of trust
  - b. to develop sense of autonomy
  - c. to develop a sense of initiative
- to moderate withdrawal or aggressive tendencies
- to express appropriate affect
- to release emotions in appropriate ways

Social
- to join group activities
- to take turns
- to share
- to play both the role of a leader and of a follower
- to care for materials properly
- to communicate freely with adults and peers
- to accept behavioral limits which must be established in a group situation

Intellectual
- to increase attention span
- to follow directions
- to recall information
- to communicate adequately
- to seek answers to questions—by asking and by testing hypothesis
- to progress through content area objectives which are compatible with ability and developmental level

Use of the following developmental checklist developed by Mrs. Janet Spyker, School Psychologist—Amherst-Pelham Schools, is recommended in September and June of the Kindergarten year as one evaluative measure of pupil growth.

Developmental Checklist

AMHERST-PELHAM SCHOOLS
Amherst, Massachusetts

Mrs. Janet Spyker
School Psychologist

NAME ______________________ DATE __________ TEACHER __________

Please complete the following checklist, checking one category under each item. If check is inadequate, please comment.

1. Ability to coordinate large muscles (walking, running, playing)
   Poor__Weak__Average__Good__Very Good__
   COMMENT:

2. Ability to coordinate fine muscles (holding pencil, marking and cutting within lines)
   Poor__Weak__Average__Good__Very Good__
   COMMENT:

3. Ability to control body functions (drooling, defecation, urination) and to care for self (dressing self, washing hands)
   Poor__Weak__Average__Good__Very Good__
   COMMENT:

4. Ability to concentrate independently on a chosen activity for at least 20 minutes
   Poor__Weak__Average__Good__Very Good__
   COMMENT:

5. Ability to express appropriate affect (sadness, fear, anger, happiness, etc.)
   Poor__Weak__Average__Good__Very Good__
   COMMENT:

6. Ability to participate in class activity (games, projects)
   Poor__Weak__Average__Good__Very Good__
   COMMENT:

7. Ability to accept constructive criticism without undue withdrawal or aggression
   Poor__Weak__Average__Good__Very Good__
   COMMENT:

8. Ability to make assumptions based on past experience (lack of repetition of similar mistakes)
Poor__Weak__Average__Good__Very Good__
COMMENT:

9. Ability to recall simple information and basic facts without hesitation
Poor__Weak__Average__Good__Very Good__
COMMENT:

10. Freedom in verbal communication with others (peers and adults)
Poor__Weak__Average__Good__Very Good__
COMMENT:

11. Relaxed attention when teacher is speaking (whether interested or not)
Poor__Weak__Average__Good__Very Good__
COMMENT:

12. Ability to follow simple directions without interceding activity or "dawdling"
Poor__Weak__Average__Good__Very Good__
COMMENT:

13. Ability to reply with relevant verbal responses to direct questions of the teacher
Poor__Weak__Average__Good__Very Good__
COMMENT:

14. Ability to speak clearly and to be understood by others without undue repetition and/or questioning
Poor__Weak__Average__Good__Very Good__
COMMENT:

15. Ability to give and take in pleasurable activities and verbal communication with peers
Poor__Weak__Average__Good__Very Good__
COMMENT:

16. Ability to differentiate between details and experiences which are important only to the individual and those which are important to an external process (story, daily routine, academic work, economic operations, etc.)
Poor__Weak__Average__Good__Very Good__
COMMENT:

17. Ability to seek information by asking questions, testing hypotheses on others, utilizing suggested resources
Poor__Weak__Average__Good__Very Good__
COMMENT:

Organizational Techniques

Amherst's kindergarten program is a combination of self-selected activities in a free-play period and teacher-directed activities during a quiet activity period.

Play fulfills many of the physical, emotional, and social situations and provides for concrete application of skills acquired during the teacher-structured groups—such as the use of money at the store, measuring at the water table, writing letters in sand, using musical instruments, experimenting with art materials, and so forth.

Observation of the child during this time provides the teacher with information and insight on each child which could not be obtained in a highly structured learning situation.

Objectives of Free Play for the Child
- to use manipulative material in activities which develop large and small muscles
- to express emotions
- to channel emotions into socially acceptable outlets
- to converse freely with peers, teachers, and aides to increase language facility
- to encounter concrete problem-solving situations, to test hypothesis, and to find solution
- to role-play—to react to situations from the viewpoint of another person
- to increase self-control
- to share
- to care for materials properly
- to lengthen attention span

The information which the teacher obtains through observation serves as a guide for program planning both for group and individualized instruction.

Does he appear to be physically coordinated?
How does he react to failure?
Is he predominantly a leader or follower? Can he assume both roles?
Does he converse meaningfully?
Does he possess adequate vocabulary?
Does he experiment and manipulate materials?
Does he use a variety of materials in a variety of ways?
What are his interests?
Does he try alternate solutions to problems?
Does he display self-control?
Is he accepted, isolated, or rejected?
Does he utilize skills learned in teacher-directed groups in his activities?

How long is his attention span on a self-directed activity?

Does he show interest in numbers, letters, books, etc.?

By what methods does he secure adult and peer attention?

A sensitive teacher, after careful observation, is able to set useful and realistic goals for the individual child. Careful and detailed anecdotal records are a necessary part of this type of learning situation.

The teacher-directed activities of the quiet activities time are content-oriented. Grouping is extremely flexible. Participation is sometimes determined by pupil interest and sometimes by teacher judgment as to appropriateness of a given activity for certain children. Both the teacher and the aide (if qualified) handle instructional groups simultaneously, and those children not directly involved during a particular ten or fifteen minute lesson are free to select activities from a number which have been set out for their use, such as puzzles, clay, or manipulative mathematical materials.

Whole group participation is sought only for evaluation periods, storytime, physical education, music, creative movement, and occasionally an art activity.

Ideally, as the year progresses children will gravitate more and more toward the more content-oriented activities, and even during the free-play period increased interest in dictation of stories, writing activities, or work with mathematical materials should become evident in many children. The observant teacher should readjust her schedule when and if this change of interest occurs and either shorten the free-play period or make provision for both group and individual instruction during this period.

At the model kindergarten, it was found appropriate to begin the morning session with free play and to end it with the quiet-activities period. These periods were reversed in the afternoon to take into account the different needs of the afternoon group, who usually had spent the morning playing and were therefore more ready, upon arriving at school, for more structured activities.

Our basic schedule therefore resolved itself into:

A. M. Free play
Recess and physical education
Quiet activities
P. M. Quiet activities
Recess and physical education
Free play

Both long-range and short-term objectives should characterize the planning for both of these large time blocks.

No time is alloted for a formal snack period, since the snack bar, open during the entire morning session and during the latter half of the afternoon session, has proven to have many advantages. First, the child may eat as soon as he is hungry. It was also found that a small table with a few children was more conducive to conversation and social learnings. It was also felt that the time involved in the formal snack time could be better spent in more purposeful activity.

ROOM ARRANGEMENT—

The room should be arranged around a variety of interest centers to provide pupils with the opportunity to make their own selection of activity for the free-play block of time as well as during the quiet-activities time when they are not directly involved in a teacher-structured group. Suggested interest centers are:

Language Corner
  Books (of the read-aloud and the easy-to-read types)
  Tape recorder and listening station
  Rocking chairs
  Pillows
  Writing materials
  Felt letters (upper and lower case)
  Consonant picture cards

Building and Construction Center
  Blocks and accessory toys
  Sandbox
  Woodworking box

Curiosity Center
  Mathematical manipulative devices (see equipment list)
  Science materials (see equipment list)
  Water table

Music Center
  Orff instruments
  Rhythm instruments
  Homemade percussion instruments

Housekeeping Center
  Play stove, sink, refrigerator
  Dolls
  Dress-up clothes

Game Center
  Puzzles
  Beads

Peg boards
Dominoes

Large Equipment Center
- Jumping and climbing equipment
- Rocker boat
- Trampoline
- Wagons

In planning location of the various centers, consideration should be given to all the materials necessary at that particular center so that nearby shelves are properly stacked in such a way that materials are accessible to the child. Easels should be near the sink.

Traffic patterns must be taken into consideration. The block corner, for example, should be out of the traffic lanes. Balance between quiet and noisy activities also needs consideration. The woodworking area, for example, should not be adjacent to the library.

Although it is necessary to provide a place for the class as a whole to gather for a common activity and to participate in games, creative movement, etc., large open areas are to be discouraged, since they serve as invitations to running and lack of restraint. Dividers should be used to delineate the various areas.

Mathematics in the Kindergarten

In the development of a mathematics program for the kindergarten, the proper physical environment is of the utmost importance. Because mathematical concepts will be developed in unstructured, as well as in structured types of learning situations, the room is so arranged as to provide for exploratory use of the mathematics area during free play periods. A variety of interesting manipulative materials are placed strategically for use during these periods. Placement of the mathematics area close to the science table facilitates application of mathematical ideas and use of mathematical equipment when developing scientific concepts. The instructional mathematics program is developed as an integral part of the total curriculum and mathematical ideas are associated with and expanded in other content areas as well as in social situations in the classroom.

The perceptive teacher must provide opportunities for developing basic mathematical concepts at various levels to provide for pupils with a wide range of background, interest, and maturity. Some children arrive in kindergarten ready only for the free play types of manipulative experiences. Others are prepared to engage in a variety of structured activities of mathematical significance.

Teacher-directed activities are of two types—common and differentiated. Certain games, projects, fingerplays, counting rhymes and songs provide a profitable experience for all pupils in the class. Other activities of a more sophisticated nature should be limited only to those pupils who possess sufficient maturity to make them meaningful. As mathematical materials are introduced, opportunity is provided for free play, utilizing these materials if the child so chooses. Apart from the social importance of free play, children need time to "build, knock down, change their minds, leave unfinished, or just look without restriction or even question."[1]

The kindergarten mathematics program is based on the following objectives:

1. To identify and name points and lines (those visible in the physical world, rather than the abstraction)
2. To identify and classify geometric shapes—circles, squares, rectangles, and triangles (without distinction between the closed line and the region; i.e., "circle" may be accepted at the kindergarten level as describing either the closed curve or the interior of the curve)
3. To apply mathematical term "set" to groups of objects
4. To use one-to-one correspondence in determination of equivalency and non-equivalency
5. To identify numerals
6. To match numerals to sets of appropriate numbers of objects (including empty sets)
7. To identify common characteristics of members of a set
8. To use intersection of sets through identification of common characteristic of some members of two sets
9. To identify subsets and rename
10. To join sets
11. To separate sets
12. To write number sentences (for advanced pupils)

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[1] Trivett: *Mathematical Awareness.* Cuisenaire Company of America, Mount Vernon, New York

13. To use place value (for advanced pupils)
14. To recite ordinal numbers and to relate these to the corresponding cardinal number
15. To make size comparisons and to measure
16. To compare numbers
17. To compare value of coins
18. To identify and use terms related to time concept (yesterday, tomorrow, when you were four, etc.) and to recognize the calendar and clock as instruments for measuring time
19. To identify and use terms related to direction and distance
20. To use mathematical skills in other curricular or environmental situations

Following are suggested specific activities for meeting these objectives:

Objective	*Activity*
To match colors To learn color names	Cut strips of red and blue construction paper. Fasten these to each pupil. Pupils are to find partners according to directions given; e.g., each red, find a blue partner, each blue find a blue partner, red find red partner. New colors are added to the game as rapidly as children are able to make identification. Later a child may become the caller. Other colors may be added as they are learned.
To pair color with color word	Teacher cuts strips of oaktag. Each of these strips is then cut in two in a zigzag fashion so that no two strips are alike. Put color word on one piece and color the other piece the corresponding color. Scatter the pieces on the floor or table in front of seated children. Have children put "puzzle" together thus matching the color with the word.
To identify circular shapes and to associate word "circle" with appropriate shape	Use Frostig exercises for perception of circle. Discuss circles in the room (clock, paste cover, paint tins, etc.). Draw circle pictures (faces, snowmen, clowns, etc.). Read and illustrate the following poem. If available, use *Sounds of Numbers* by Bill Martin, which has excellent illustrations, to accompany poem.

Objective	*Activity*
	Round is a Pancake Round is a pancake Round is a plum Round is a doughnut Round is a drum. Round is a puppy Curled up on a rug. Round are the spots On a big ladybug. Look all around On the ground In the air. You will find round Things everywhere. Play circle games (Farmer in the Dell, Drop the Handkerchief, etc.). Have pupils sit in circle to listen to a story.
To identify square shapes and to associate word "square" with appropriate shape	On flannelboard place squares of various colors and sizes. Have pupils count the corners. Have pupils place a smaller square on the larger square so that they can see "sameness" of the corners. Place the squares at varying angles on the flannelboard and have them named in each position. Place a square on a chalkboard and draw a chalk line along one side. Have pupils measure other sides to that chalk line to show that in a square, each side is the same length. Pass out square sheets of paper. Direct pupils to fold paper in half twice and open it. Have resultant shapes identified and counted. Identify square shapes in classroom.

Objective	Activity
To duplicate given sequence To test visual memory	Prepare two sets of geometric shapes of varying colors. Lead-off player places a sequence of colored shapes on the board. Second player duplicates sequence. After several successful duplications and exchanging of leader's role, the leader displays a new sequence and allows a minute for the second player to study sequence. Leader then removes a shape and asks the other to state which shape is missing. If player is successful, he becomes the leader and game continues.
To recognize sequence and to identify the next object in continuing sequence	String beads in a color or shape sequence or put construction paper shapes in a particular sequence. Child must select proper bead or piece of paper to continue sequence.
To make size comparisons	Have circles of various sizes cut. Have pupils arrange from smallest to largest. As perception improves, number of shapes provided may be increased and amount of difference in size decreased.
To identify rectangular shape and to associate name and rectangle with appropriate shape	Match corners of squares and rectangles to see that both have the same "square corner." Lead children to see how rectangles and squares differ. Trace a side of the rectangle on the board. Turn rectangle and have children observe by this type of measurement that a rectangle has sides of two different lengths.
To differentiate between squares and rectangles	Use pegboard to make squares and rectangles. Use Frostig exercises which provide for recognition of various geometric shapes. Draw trains, houses, books, etc., for square and rectangle pictures.
To identify triangular shapes and to associate name triangle with appropriate shape	Using a variety of sizes and shapes of triangle, lead pupils to discover in what one way they are alike (three sides). Introduce the triangle of the rhythm band. Make pictures containing triangles, rockets, witches, kites, etc.

Objective	Activity
To match shapes To learn shape names To use color names and shape names in following directions	Cut geometric shapes of various colors. Pin these shapes to the pupils, who then move about room and find partners according to the directions given; e.g., find a partner wearing the same shape. Find a partner wearing the same color. Find a partner who has both the same shape and the same color. Fill a bag with squares, circles, and triangles of three different colors. Construct cards which have three colored rows with shapes drawn in black. Game is played like Bingo. First player reaches into bag. Places the shape on correct square on Bingo card. Second player then draws from bag and plays on his card. In the event that the player draws a shape which he has already covered, the shape is returned to the bag and the turn is "lost." Winner is child who first covers entire card. Cards described above may be used. Two cubes are also needed (a spinner could be substituted). On three faces of an uncolored cube, draw a circle, a square, and a triangle, using a black magic marker. Leave other three faces blank. On second cube color three faces to match the three colors on Bingo card. Leave the other three faces blank. Each child is provided with each of the three shapes in three different colors of construction paper. The first child rolls the two cubes. If, for instance, the red face is up on one cube and the triangle on the other, he may place his red triangle over the one drawn on the card. If one of the blank faces comes up on either cube, the child, of course, cannot play and the cubes are passed to the next child. Game continues until card is completed.
To identify shapes	Draw a large man on the chalkboard, using circles, squares and rectangles. Have children come to the board and outline the various shapes in a given color. Provide paper for them to create their own figures using the various geometric shapes—animals, trains, cars, witches, rockets. Cutout shapes could be provided, with children mounting these and adding crayon detail. More mature children could cut their own shapes.

Objective	*Activity*
	Construct mobiles using the geometric shapes.
	Provide each child with a circle, square or triangle. Teach the following song to the tune of "Did You Ever See a Lassie?" Child responds by showing the correct shape. Did you ever see a circle, a circle, a circle (or triangle, or square) Did you ever see a circle? Please show us one now. Oh, Mary, Oh, Mary, Oh, Mary, Oh, Mary (substitute any child's name in group) Did you ever see a circle? Please show us one now.
To identify shapes using only kinesthetic clues	Put shapes in a large box; have child stand with his back to the box. Child picks one shape from the box and attempts to tell what it is without looking.
To identify shapes	Construct fish for Fish Pond Game. Staple geometric shapes to fish. Give pupils buckets with the geometric shapes. Using a fishing pole with a magnet, pupils catch fish and place in appropriate bucket.
To make geometric shapes	Pupils draw shapes in air as they recite verse. (Instructor June-July 1967) Draw a circle, draw a circle Round as can be. Draw a circle, draw a circle Just for me. Draw a square, draw a square Shaped like a door. Draw a square, draw a square With corners four.

Objective	*Activity*
	Draw a triangle, draw a triangle With corners three. Draw a triangle, draw a triangle Just for me.
To construct geometric shapes, lines, intersections, etc.	Use wall-mounted pegboard or individual pegboards — To make squares, triangles, rectangles To make a line shorter or longer than a given line To make equal lines To divide a line in half To make lines that cross.
To discriminate between square, rectangle, circle and triangle	1. Relay Game. Use heavy yarn to make shapes on floor. Children make 2 teams. Each team has many construction paper shapes. On signal, one child from each team runs to place paper shape in large outline. 2. Stepper Game (Plastic rug-like board with transparent pockets. Can be made with inexpensive plastic runner.) Child hops on shape that teacher or another child calls out. May also involve color discrimination ("hop on yellow rectangle").
To construct shapes using geo-board	Free play with large colored rubber bands and the geo-board should precede all teacher-structured activities. Teacher could then give directions similar to the following: Let's make a house on the geo-board. Who will make the side, the door, the window? Which is larger, the door or the window? Are there any squares in the house? Are there any rectangles? Who can make a figure with three sides? Who can make a larger three-sided figure?

Objective	*Activity*
To identify numerals, geometric shapes, or letters kinesthetically	Cut figures to be used out of sandpaper, and mount on cards. One child is blindfolded. A card is shown to the class. The blindfolded child then traces the shape with his finger. If the correct identification is made, he may choose the next child. If he is unable to make the identification, the blindfold is removed and he is permitted to retrace while looking at the numeral. The blindfold is then replaced and he is asked to select the card exposed to him previously from two cards now given to him. After this turn, he selects the child who will play next.
To count to three To make size comparison	Use the following fingerplay: Three Balls Here's a ball, (small circle made with thumb and index finger of one hand) And here's a ball, (Larger circle made by using both thumbs and both index fingers) And a great big ball I see. (huge ball, using both arms) Shall we count them? Are you ready? One! Two! Three! (Each of the circles is made as counted)*
To learn mathematical term "point"	Draw dots on blackboard. Tell pupils that these dots represent points. Prick paper with a pin. Hold up to light. Have pupils make other "points."
To compare mathematical terms "straight" and "curved"	Draw two dots on the chalkboard. Have children tell that these two dots represent points. Connect the two dots with a curved line. Discuss shape of line. Draw two dots and connect with a straight line. Discuss the line. Make series of curved and straight lines for pupils to identify and compare. Make dots and direct pupils to connect two with either a straight or a curved line.

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* **Hurd:** ***Teaching in the Kindergarten with Emphasis on the What and the How to Teach.*** **Burgess Pub. Co. Minneapolis, Minn.**

Objective	*Activity*
To identify a straight line as the shortest distance between two points	Draw a *widely* curving line between two points on board. Ask pupils if they can see any way to draw a shorter line between the two points. Continue until someone makes a straight line. Give pupils a paper. Have them make two pinholes. Then draw several lines between the points of varying colors. Direct them to make the shortest line between the two points in red. Make two dots on large chart paper. Take three or four pieces of yarn of various colors and lengths (one of which is equal in length to the distance between the two points). Have pupils compare lengths of yarn to determine which is the shortest and have its color noted. Dip ends of the strands of yarn in glue. Affix ends to the two points. Lead pupils to observe that the yarn they determined by measurement to be the shortest is the straight line between the points.
To identify and use mathematical term "set."	Direct pupils to describe various collections of objects in the classroom, such as books, blocks, children, toys, etc. Introduce the word "set" as describing objects put together in a group. Have pupil place yarn around sets of objects which are specified. Have children cut and paste sets (e.g., of green things, of triangles, of toys, etc.). Pickup time — Have pupils arrange materials on shelf according to sets (e.g., books on top shelf, dolls on second shelf, trucks on lower shelf).
To use one-to-one correspondence To learn and use term "equivalent"	Draw sets of objects on chalkboard, both sets having the same number of members. Direct a child to draw lines to match the numbers in the two sets. Since there are no left-over objects in either set, the sets are said to be equivalent. Introduce this term to describe any two sets with the same number of members. Have eight children stand in front of the class. Group them into two sets of four. Have each member of one set join hands with a member of the other set. Then ask the children to change partners to show that the sets are equivalent no matter how they are matched.

Objective	*Activity*
	Have children cut out and paste equivalent sets and draw lines to show one-to-one correspondence.
	Have pictures or objects for classification (e.g., fruits, toys, clothing, furniture, etc.). Have children select pictures or objects for his set.
To learn that one set is equivalent to another set if they correspond one to one	Show set with one member using Unifix cube. Ask child to make set that is the same as yours. When he does, say, "Your set is equivalent to my set." Add one more cube to your set. Repeat directions to child. Ask "How do you know if your set is equivalent to my set?" Continue, perhaps building larger sets and asking child to build equivalent set without counting your set.
To learn to use term equivalent. To learn to use one to one correspondence. To determine equivalence.	Peanuts taped to chalkboard or balloons. Ask children to draw a set of squirrels or children so that each squirrel will have a nut or so each child will have a balloon. "How can you tell without counting that the set of balloons is equivalent to the set of children?" Show the children how to draw lines from one balloon to one child. "Is there a balloon without a child?" (or vice versa). "Then these sets are equivalent." Take balloon (or nut) away. "Are the sets equivalent now? Why not? How might we make them equivalent?"
To use term equivalent and non-equivalent	Construct sets, which children can prove equivalent, by one-to-one correspondence. Introduce the term equivalent as related to the sets. Construct two sets which do not have the same number of members. Introduce term non-equivalent after pupils have proven sets do not have the same number of members by means of one-to-one correspondence. Have pupils construct equivalent and non-equivalent sets.
To classify objects into sets	Have them explain why they included and why they excluded certain items. Have objects grouped and regrouped in as many ways as possible.

Objective	*Activity*
To recognize qualifications for set membership	Use two jump rope rings or two hula hoops. Give varied directions for children to get into the circles to form sets (e.g., all the girls—all the boys; blue-eyed girls—brown-eyed girls, etc.). Later, when skill is gained overlap the ropes but still give directions for disjoint sets. Lead pupils to see why no one can step into intersection.
To recognize qualification for using an intersection of two sets	Later, given directions which would allow some children to proceed to the intersection, (e.g., all the girls with blue dresses in one circle—all the blonde girls in the other). Lead children to see where girls who are blonde *and* wearing blue dresses may go.
To use one-to-one correspondence	Play Tally. Draw a diagram with chalk on floor. Two children throw beanbags and record the tallies behind their name. Tally marks are matched one-to-one on score chart to see who wins.
	Have pupils do one-to-one correspondence activities such as passing out scissors or crayons, putting straws in milk, passing crackers at snacktime, etc.
	Use seasonal activities—such as matching witches to cats, Pilgrims to Indians, or Christmas stockings to children.
To show one-to-one correspondence	Form sets of objects in classroom. Have pupils match up set numbers (e.g., balloons to children, lollipops to children, toys to tables, shovels to pails, straws to milk bottles, etc.)
To use terms more, less, equivalent, non-equivalent	Have pupils cut pictures from magazines and paste to form sets. Then draw lines or glue yarn to show one-to-one correspondence. Discuss equivalency or non-equivalency of sets constructed; which sets contain more, which contain less.

Objective	*Activity*
To identify sets as being non-equivalent	Place enough felt cutouts on flannelboard to form three or more sets. All but one of the sets should contain the same number of members. Put yarn around each set. Have children identify the non-equivalent set by using yarn to pair members of different sets.
	Have children think of sets which would contain only one member (e.g., number of teachers in the room) or two members (a pair of boots, mittens, etc.).
To learn and use terms "more" and "fewer"	Proceed as above for non-equivalent sets. Introduce terms "more" and "fewer" to describe the number of members in each of two non-equivalent sets.
	Use milk cartons. Game "Cartons, cartons on the floor; are there fewer or are there more?"
	Children sit in circle with cartons in center. One child leaves room while another alters number of milk cartons in circle. Upon returning, children recite poem. Then "It" answers with "more cartons" or "fewer cartons."
To use terms "less than" and "greater than"	"I am thinking of a number less than 7." Students narrow choice by asking such questions as "Is it less than 4?" "Or is it greater than 2?" (Good practice in developing strategy of "narrowing the field.")
To compare two numbers and to learn and apply terms more or less, fewer	Construct sets for comparison. Have two hats. Put some rabbit cutouts in each. Have pupils discover which hat has more rabbits and which has fewer.
	Place a set of objects in center of flannelboard. Have pupils make sets with fewer objects on one side of the board and sets which contained more objects than the original set on the other side of the board.

Objective	*Activity*
To identify and use term "empty set"	Arrange cutouts on flannelboard to form set. Place yarn around set. Then remove all of the cutouts. Ask the children to describe this new set. Introduce the term "empty set" following their descriptions. Have children give examples of empty sets (e.g., elephants in the room, ten-feet-tall children in the class, etc.).
To recognize numerals To recognize number sequence	Devise a dial for children to practice dialing their own telephone number. Make individual number lines on masking tape on tables or using adding machine tape.
	Materials: deck of cards 2-10. Deal cards. Player with a 7 may put it out. Next child, in order to play, must have a 6 or 8 of the same suit in order to put down a card. If no card available, must lose a turn. Child with no cards left wins.
	Use a calendar to see the progression of numbers.
To identify number sequence	Have an unlabeled number line. Play the magnetic fish game. As fish are caught, they are placed at correct dot on number line.
To identify numerals	Using number and dot squares, play twister (using plastic stepping game) number recognition. Child places hand on number called, then other hand, then a foot, etc.
	Numerals placed on cards. Cards placed face down. Child draws card; if he knows number, may keep it. If not, is told number, must put it back, and it is next child's turn. Child with most cards at end of game wins. Number Bingo. Child calls row by letter, then number in that row. First child to have all in a row, vertically or horizontally, wins.
To learn to form numerals	Children trace forms made by teacher, perhaps on chalkboard or on paper (teacher's in pencil, children trace with marker) while reciting these poems:

Objective	*Activity*
	1. A line straight down is fun, and that's the way we make a one. 2. Around the railroad track and back, two, two, two. 3. Around a tree and around a tree, and that's the way we make a three. 4. Down and across and down once more, and that's the way we make a four. 5. A big fat five goes down and around, put a flag on top and see what you've found. 6. A curve and a loop and a six throws a hoop. 7. Across the sky and down from heaven, and that's the way we make a seven. 8. Make an "s" but do not wait, climb back up to make an eight. 9. A loop and a line make a nine. 0. Circle around to make a zero, and you will be a great big hero.
To recognize numerals and relate to sets	For each numeral taught, provide much concrete activity with objects in classroom, flannelboard cutouts, pupil drawings, etc. Have ongoing sequential displays as numerals are introduced (such as stringing beads, one bead topped with the numeral 1, two beads topped with the numeral 2, etc.) Use finger plays and counting rhymes for each numeral. Construct progressions on abacus or pegboard. Make charts of gingerbread men 1, 2, 3, 4, etc.
To identify sets of three objects	Use overhead projector or flannelboard cutouts with the following counting verse (from Greater Cleveland Mathematics Program):
To count to three	I see three — one, two, three Three little bunnies, Reading the funnies.

Objective	*Activity*
	I see three — one, two, three Three little kittens, All wearing mittens. I see three — one,two, three Three little frogs, Sitting on logs. I see three — one, two, three Three little bears, Climbing upstairs. I see three — one, two, three Three little ducks, Riding on trucks.
To count To relate action words to verse	*Three Balls* (Greater Cleveland Mathematics Program) Here is a big, round, bouncy ball. I bounce it 1, 2, 3. Here is a ball for throwing. I can catch it. Watch and see. Here is a ball for rolling; Please roll it back to me. Bouncing; Throwing; Rolling ball. Let's count them: 1, 2, 3!
To match numerals	Postman Game—Most of the members in the class are given houses cut from construction paper with numbers upon them. The other children act as postmen and deliver mail to the houses. The mail consists of appropriate numerals on cards.

Objective	*Activity*
To identify numerals	Number Change—Ten children stand in a circle, each holding a number. The teacher calls out two numbers and the children holding the cards exchange places. Children are given number cards consisting of numerals one to ten. Then the engineer, a child, calls out the numbers and the children arrange themselves in order, pretending they are cars on a train.
To match sounds to corresponding numeral	Give each child a set of numeral cards. Have a child out of view of the children tap rhythm sticks together a certain number of times. Children hold up the correct numeral.
To match numerals to corresponding set	Make ten large sailboats out of construction paper and mount these along the chalkboard or wall. Cut a captain's hat out of paper. Construct "tickets"—domino charts whose sums are numerals from one to ten. A child is chosen to be captain. He calls out, for example, "All aboard for boat seven." Each child who has a ticket with a sum of seven presents his ticket to the captain. If his ticket is "in order" he may "board" boat seven. Otherwise, he returns to his seat and awaits another sailing.
To recognize missing numeral in group of cards	Missing Number Game—Place numerals on pieces of oaktag in chalk tray. A child closes his eyes while another child takes one of the cards from the chalk tray. The first child then opens his eyes and tells what number the second child has taken.
To identify numerals 1-10 To match numerals to sets	Game: Caps for Sale. Use Unifix cubes and caps. Cubes represent "children", parents (students) bring "children" to store to purchase caps (with numerals). Cap purchased must be right "size". Size is determined by age of child.

Objective	*Activity*
To match numerals to corresponding set	Use Unifix cubes and trays and caps. Show a set containing no more than ten members. Ask child to find tray for set so that no space is empty and all cubes fit into tray. Ask child to count cubes. Point to numeral at top of tray. Say that this numeral tells how many cubes are in this set. Ask child to find cap that tells how many members in this set. Remove set from tray and place cap on top.
To match number of objects to numeral on card	Use flash cards, each having a number. Have same number of pumpkins (or any flannel figure or object) ready. Child matches number of pumpkins to number on flash card.
To relate objects to corresponding numeral by kinesthetic, as well as visual clues	Provide pupils with boxes in which hosiery is sold. Any small objects can be used. These objects would be affixed to box to illustrate a given numeral. Some suggested objects might be: pine cones, birthday cake candles, miniature bars of soap, bottle caps, buttons, clothespins, plastic spoons, etc.
To count to five To match sets of objects up to five with the corresponding numeral	Make a fish pond. Provide buckets for fish on which numerals one to five have been written. Make fish which have sets containing 1-5 objects drawn upon them. Attach paper clip to fish. Provide pupils with "line" with magnetic hook. Pupil catches fish and must deposit it in the bucket which has the numeral which corresponds to the number on the fish. (Some fish could be placed in pond without paper clips.)
To find rhyming words To begin to list things a magnet will attract and things it will not To listen in order to insert missing word	Recite the following rhyme—pausing for children to insert number word:

Objective *Activity*

Fred and His Fishes

Fred had a fishbowl

In it was a fish
Swimming around with a swish, swish, swish!

Fred said, "I know what I will do.
I'll buy another and that will make_____."

Fred said, "I am sure it would be
Very, very nice if I just had _____."

Fred said, "If I just had one more,
That would make one, two, three, _____."

Fred said, "What fun to see them dive.
One, two, three, four _____."

How many fishes do you see?
How many fishes? Count them with me.

Objective	*Activity*
To count to six and to identify sets with six objects	Give numeral cards 1-6 to some children and set cards 1-6 to some children. Play a marching record. When a number is called out, the child holding the proper numeral finds the child holding the corresponding set, and the two march around the outside of the circle as game continues and other children are thus paired. Have children place kitten on flannelboard as this counting verse is recited:

Objective *Activity*

Counting Kittens
One little kitten with a furry tail;
Two little kittens lapping milk from a pail;
Three little kittens rolling on the floor;
Four little kittens running out the door;
Five little kittens roll a yellow ball;
Six little kittens, and now that's all.

Objective	*Activity*
To learn that each number is one larger than preceding number	Use Unifix cubes and tray. Ask child to put enough cubes in first section so that they fill the space completely (one cube). Ask child to make another set that is equivalent to the first set and put it in next section. Ask "Does it fill the space?" (No). Add more cubes so that your set will fill space. Ask "How many more cubes did you need?" Continue asking that child make set equivalent to one just completed, and then adding more to fill space. When child seems to be catching on to method (you'll know when he has one more ready before you ask how many more will be needed to fill space) ask, "This number (point to section) is how many more than this number?" (Point to section preceding.) Do this for all sections in tray.
To identify numerals To match colors To match numerals to appropriate set of objects	Make a set of cards which have a list of numerals printed in various colors. Provide pupils with sets of colored beads. Have children string beads as indicated by colored numerals on card. (If the first numeral is a yellow 2, the pupil must string two yellow beads, etc.)
To relate set and subsets	Pile blocks up to whatever size set is being studied. Place numeral cards in front of each sequential pile. Then discuss and measure the piles which could be used to make a given set. Prove hypothesis by stacking subsets and matching to large set. Divide counters into subsets. Use a flannelboard. Place set upon it. Put yarn around various subsets.

Objective	*Activity*
	Provide worksheet with sets of objects pictured. Direct pupils to color *part* of each set red and *part* of each set blue and then discuss subsets each has formed.
To learn that numbers can be renamed	Show child domino. Ask him to find a domino with just as many dots as yours. Ask him to tell you the number of dots on each side. Explain that 1 and 4 is another name for 5. As means to evaluate above, play relay game. On colored paper, place domino. Children are given stack of dominoes which are new names for those on colored paper. At given signal they run to place their domino on the correct paper (next to name for their domino).
To identify subsets	Show child set of Unifix cubes stacked. Give him two colors of Unifix cubes. Ask him to use them to build set as tall as yours, equivalent to yours. Ask him to identify subsets. Using balance or sum stick on one side, place weight or set cubes, ask child to use two subsets to balance your set.
To identify subsets as readiness for addition	Use Unifix cubes and trays. Use only two different colors for cubes. Give child tray; e.g., four. Ask him to fill the tray. After he does, discuss how he made four; e.g. 3 red cubes and 1 yellow cube make 4. Encourage him to find other ways.
To join sets as readiness for addition	Place two sets of objects on the table (one set of books, one set of pencils). Have the children describe or list the members of each set. Tell the children that you would like a larger set containing both books and pencils. Ask a child to make this larger set using all of the books and all of the pencils. After he has put together the two sets, introduce the word "join." Have the pupils now list or describe the members in the new joined set. Ask two girls to stand on one side of the room. Have three boys stand on the other side of the room. Again express your desire to have one larger set containing both the girls and the boys. Ask the boys to join the girls. Have someone describe this new joined set. Give many additional opportunities for the children to join sets, such as joining a set of crayons with a set of scissors, yellow crayons with red crayons, two sets of flannelboard cutouts, etc.
To join sets as readiness for addition To follow directions which use the new term "join"	Place two sets of objects on the table (e.g., a set of books and a set of pencils). Ask a child how a larger set containing both books and pencils might be made. Have volunteer put the two sets together to make a new, larger set. Then introduce the term "join". Have pupils join other sets when directed (e.g., red and yellow lollipops—girls with blue dresses, girls with red dresses, etc.). Have four monkey cutouts on flannelboard. Have two monkeys in a tree. Discuss this set of two. Recite the following verse while moving the monkeys to the tree. Give children opportunity to discuss the joining of sets as it occurred. Recite the poem again with a child "joining" the sets. *Four Little Monkeys* Two little monkeys sitting in a tree Were joined by another, and that made three. Three little monkeys in the tree did play, They chattered and chattered in a happy way. Three little monkeys wishing for one more, Another came to join them, and that made four. Monkeys, monkeys, how many do I see? Four little monkeys sitting in a tree.
To separate sets	Unifix cubes. Show children set. Have them make an equivalent set. Without letting them see, put some of your cubes behind your back. Ask them to use their stack to discover how many cubes are behind your back. You might make up stories to add interest; e.g., you are a stockboy in super-

Objectives	*Activity*
	market. These cubes are cans of soup (spaghettios). You made a stack 7 cans high and then went to lunch. When you returned, the stack was this high (show them). How many cans were sold?
To count by two's	Use number line and introduce "skip counting." Skip, then count. Skip, count.
To use concept one-half	Teacher defines the word half as one of two parts of the whole, both of which parts are the same size. Teacher divides construction paper shapes into two equal parts. Pupils place the two parts on top of each other to determine if they are the same size. Other objects are divided—some in half and some into two unequal parts. Pupils sort those which are divided in half from those simply cut into 2 pieces. Pupils then divide shapes, or cookies, oranges, or candy bars in half. Note how clock is "cut" in half at half past the hour.
To identify half of a set	Begin with sets of two. Ask pupils to divide this set so that each half is equal or has the same number of members. Continue with sets of 4, 6, 8, etc.
To learn form of number sentence	Tell story, using objects or flannelboard; e.g. "One summer day I walked to pond to feed the ducks. I saw 3 ducks in pond. As 2 other ducks saw the food, they came too. How many ducks did I feed?" Bring out that 3 and 2 is another name for 5. Ask "When we tell how many ducks there were first, do we write the word '3'? What do we use to show us how many ducks there were?" Children should know term "numeral." Place numerals under each set of objects. Have children repeat what these symbols tell us—3 and 2 is another name for 5. Put in place + and =. Ask children what these symbols might show. If they can't guess, ask them to repeat what pictures show — 3 and 2 is another name for 5. Tell them that + can be called or read "and" and that = can be read "makes" or "equals."

Objective	*Activity*
To learn to identify specific number sentences	Use stepper game. In panels have number sentences; e.g. 3 + 2 = 5. Children draw from box that contains pictures of number sentences. Relay game. Children have stack of cards with pictures of number sentences. At a distance away, on squares of paper are written several number sentences. Children, in relay fashion, run to place their card in correct box. Children make life-size number sentences, each child given number or word "and" or "makes." Teacher shows story on flannelboard. Children arrange themselves to form number sentence. Teacher may note number of seconds children take to inform them how they improve.
To complete number sentences	Use balance scale. Place, for example, 2 counters in one pan and 5 in the other. Present the number sentence 2 + ___ = 5. Have pupil add counters until scale balances. Then complete sentence 2 + 3 = 5. To maintain flexibility, vary the position of the blank in the number sentence. Use Unifix cubes. Have a tower of 2 cubes and one of 5. How many must be added to the 2 tower to make 5? Use number line and have an animal cutout make the necessary jumps to complete number sentence such as the one above.
	Play "I'm Thinking of Two Numbers." Pupil says "I'm thinking of two numbers that make 5. One number is 2, what is the other number?"
To recognize numerals 10, 20, 30, 40, 50, 60, 70, 80, 90 To learn that our number system is based on ten To recognize tens	Using abacus, count to 10, 20, 30, etc. Have child find card that says 20, etc. Use stepper game, hop on numeral that shows 2 tens and 0 units. In marking calendar, use abacus to count off days. Let child trace over numeral, repeating that 2 stands for 2 rows of ten and 1 for 1 unit in 21. Mount old steering wheel on board. Draw gauges. Odometer reading by 10's. Also good for introduction of such terms as slower - faster. Gas tank — full - ½ full - empty.
To learn 10-ness of our number system	Use abacus. Lead children to note that there are an equivalent number of beads in each row; i.e., ten. Count aloud with children to 10. Ask "How

Objective	*Activity*
	many rows of 10?" Continue counting, stopping at 20, 30, etc., to ask "How many tens?"
	Counting Unifix cubes. Show stack of ten cubes. Give each child cubes (a multiple of 10). Have each child count out loud, touching each cube as he says number. First number will be eleven. 11-19. Interrupt their counting by asking if the next number is ten-teen. Say "Each time we get to ten we group." Have children put stack of 10 cubes aside and continue counting 21-29. "Is the next number 20-ten?" "What happens now?" Continue. When finished counting cubes, ask "How many cubes in each stack? Why?"
To count by tens	Count sets in this manner: 1 ten, 2 tens, 3 tens; then introduce terminology ten, twenty, thirty, etc., and count sets, using these numbers.
To use two-to-one matching	Provide two lollipops or two balloons to each child. Have pupils continue with similar two-to-one matching.
To group by tens	Have children use abacus. Make strings of 10 beads. Sew 10 buttons on a card. Stack 10 Unifix cubes.
To identify value of dime To recognize place value	At store, provide children with dimes and pennies to make purchases. Have a large price list displayed, with a dime pasted over the tens column and a penny over the ones column. Have children use this chart to assist them to know how many dimes and how many pennies to pay for given items from 10¢ to 99¢.
To recognize ordinal numbers	Pupils line up on number line. Who is first, second, etc. Work with days of the week or month.
	Inflate balloons of various colors. Give one to each of a group of pupils. Ask another child which is the first, or second, etc., balloon. If he responds correctly, he may hold that balloon.

Objective	*Activity*
	Make paper hats with numerals and place on shelf. Line up pupils. Discuss who is first, second, etc. Have pupils select appropriate hat, put it on, and return to line in proper sequence.
To learn days of week To use ordinal numbers	Play "Here We Go Round the Mulberry Bush". Ask questions such as, "If Sunday is the first day of the week, what is the second? The third?"
To match numeral to its corresponding ordinal number	Choose a child to play Bo-Peep. Children sit in circle with numbered sheep in front of some of the children. The group recites *Little Bo-Peep* while Bo-Peep calls to her first sheep, second sheep, etc. Each child lines up behind Bo-Peep as his numeral is called. Game continues until all the sheep have been "found." Vary game by having Bo-Peep call sheep out of sequence and have each child find his appropriate sequential position when he is called.
To identify objects using *ordinal* numbers	Make yarn stairs on a flannelboard. Retell story of *Three Bears,* or just the portion where they climb the stairs to the bedroom. Expand this section of the story with details, such as the "Father Bear stomped on the first step....Mother Bear went to the third step....Baby Bear could barely make the fifth step," etc. Have pupils come forward and move the bears up the stairs as the ordinal number is given. When proficiency in ordinal numbers has been acquired, portion of story could be related which tells of Goldilocks' flight down the stairs for reversing ordinal number sequence.
To make size comparisons	Use the following story: *What Is Big* by Henry Ritchit Wing (If *Sounds of Numbers* by Bill Martin, Jr.; Holt, Rinehart and Winston, is available, it could be used. Illustrations are excellent.) My name is Tommy. I am not very big. I am not as big as a goat.

Objective	Activity
	A goat is bigger than I am. I am not as big as a horse. A horse is bigger than I am. I am not as big as an elephant. An elephant is bigger than I am.
	I am not as big as a whale. A whale is bigger than I am. I am not as big as a dinosaur. A dinosaur IS THE BIGGEST THING I KNOW. My name is Tommy. I am not very big.
	BUT
	I am bigger than a dog. A dog is bigger than a cat. I am bigger than a cat. A cat is bigger than a mouse. I am bigger than a mouse. A mouse is bigger than a grasshopper. I am bigger than a grasshopper. A grasshopper is bigger than a ladybug. A ladybug is the smallest thing I know.
	Follow-up—Provide pupils with sheets of paper of varying sizes. Have them choose the animal mentioned in the story which they would like to draw. Give them paper of appropriate size. Stress that their animal must fill the paper provided. Then arrange pictures from smallest to largest. Give pupils practice in comparative forms of the adjective to describe size differences between any two pictures. Have pupils discuss smallest and largest things they know. These could be listed on a chart and illustrated.

Objective	Activity
To measure using arbitrary units	Hold up a book and ask children to think about how many books could be laid end-to-end along the edge of the table. Ask two children to come up and put books end-to-end to find out how long the table is. Have them complete the sentence, "The table is ——— books long."
	Use pencils, hands, sheets of paper, etc., as measuring devices and measure various objects around the room.
	Use arbitrary units of measure in classroom store before introduction of fixed units.
To learn that size is relative	Show two blocks. Which one is smaller, larger? Add a smaller block. Are you certain (one of first two) is smallest? Why did you change your mind? Repeat, adding either smaller or larger blocks.
To learn that one can measure using any object as the unit of measure	Units—2 different sized blocks. Use these to measure height of child. Ask after using smaller unit "Will it take more larger blocks or fewer larger blocks to measure how tall you are?" Use units to measure other objects. Read "How Big is a Foot?"
To compare length	Play "Can You Name It?"—One child names several objects around the classroom and asks which is the longest or the shortest. Child who answers correctly gets to ask next question.
	Use boxes and sticks of various sizes. Ask children to select sticks which will fit in various boxes. Use terms longer and shorter to compare box to sticks to explain why some will fit in and some will not.
	On chalkboard draw a brook, a raccoon, and three boards of various lengths. Have children decide which boards would be long enough to cross the river.

Objective	*Activity*
To compare weight	Use balance scales to weigh objects around the room. Use some where size-weight relationship is reversed, such as a small steel ball and a large styrofoam ball. Use seesaw on playground to compare weight of children.
To match ordinal number to corresponding object in sequence	The following verse from *Instructor*, March 1968, could be used as a finger play or dramatized with puppets. Chalkboard drawings could also be used.

Birds in Spring

Five little birds sat on a tree.
First one said, "Spring is here, I see."
Second one said, "I'm tired of winter snow."
Third one said, "Spring is here, you know."
Fourth one said, "Get busy, build your nest."
Fifth one said, "Let's beat all the rest."

So off they flew, up to the sky,
Then down they flew, for twigs they could spy.
They built a nest, so nice and round,
And laid three eggs — then not a sound.

Till one day, a crackle, and then a "peep,"
I looked, and in the nest so deep —
Three tiny birds, mouths open wide,
So mother bird would drop a worm inside.

They grew and grew until one day,
They became so restless to fly away
They jumped from the nest, as birdies do —
They tried their wings, and off they flew!

Objective	*Activity*
	I peeked in the nest, so empty and bare, Not a sight of the eggs or birds were there. Poor mother bird, she works so hard and then — Soon her nest is empty again.
To use tactile approach to numeral formation	Teacher prepares large numeral cards which have a green dot where the numeral begins and a red dot where it ends.
To write numerals correctly	This activity could follow-up a traffic light lesson in which green and red have been taught as "go" and "stop" colors, or this meaning of red and green could be taught in conjunction with this lesson. Child taking a turn will point to the green dot on a given numeral. He will say "go," then trace the numeral with his finger to the red dot when he says "stop." After sufficient practice child may begin to reproduce numbers on his own. Children may enjoy this activity in pairs after class presentation.
To identify subsets as readiness for addition and subtraction	Draw a large three-scoop ice cream cone on board. Color two scoops chocolate and one scoop white. Discuss these subsets. Make other arrangements of flavors. Have one, then two scoops "eaten." Have pupils see what remains. "Cut" back to the empty set — the empty cone. Use Stern rods, blocks, or oaktag strips to represent various numbers. Give child a three-block strip and see how he can make another strip the same size by using 1 and 2 block strips. Place two toys on the table. Have a child place enough more toys to make four. Make folding domino cards. Expose one side with perhaps three dots. Ask how many dots are needed to make four. Then expose the one dot on the other side of the card. Have pupils count the total number of dots to determine correctness of response.

Objective	*Activity*
To identify subsets as readiness for addition and subtraction	Use pegboard with varied colored pegs to illustrate subsets.
To use clock in meaningful situation	The clock will tell when certain things are to be done. "When the long hand is ____ and the short hand is ____ it will be ____ o'clock and time to ____." A play clock can be pre-set in the room and when the real clock reaches the same position a comparison can be made and the planned activity may proceed. Times to look for on the clock: Clean-up, Story, Gymnasium, Work Time, Time for time's sake (as an observation), Time to get dressed, Time to go home.
To count and to recognize "day" as a time unit	Important days indicated on calendar—How many days ago was it John's birthday? How many days will it be until Mary's birthday? Our trip? Friday? Match the daily number to the same number on a complete calendar. Two calendars are necessary, one filled in daily and one already completed for the month. As the daily calendar is done, the child matches the single number to the same number on the large calendar.
To identify relationship of liquid measures	Have pupils work at water table with pint and quart containers. Have pupils find how many times contents of pint container can be poured into quart. When 2 to 1 relationship has been determined, have pupils arrange pint and quart containers (or flannelboard cutouts of same) by 2 to 1 matching. Same procedure can be followed for cups and pints.
To use term "dozen"	Introduce term "dozen" as meaning twelve. Have pupils fill egg cartons and count the eggs. Find half of the set or half a dozen by dividing the set

Objective	*Activity*
	into equivalent parts. Pupils can determine how many objects are in half a dozen.
To compare value of coins	Have variety of activities comparing value of penny, nickel, and dime by illustrating how many lollipops or pieces of bubble gum could be purchased with each. Provide "store" situations for "buying" candy or toys.
To use calendar	Have pupils mark off days of week. Discuss how many days until a certain event. Discuss "weekdays" and "weekends." Name the days of the week. Discuss yesterday and tomorrow in terms of activities. Make a 5½ year time line with illustrations of children at age 1, 2, 3, 4, 5 and 5½.
To use clock	Note where hands point upon arrival at school and other times of the school day. Set an alarm to ring in an hour. Have pupils put heads down for one minute. Observe how far long hand moves during a story.
To measure	Height of each pupil is marked several times during the year. Each child has his own growth record. Have pupils measure other objects of their choice on height chart. See if pupils can find something *less* than a foot long. Prove it by measuring. Have pupils guess who is the tallest in the class; the shortest. Look for something about a yard long. Check it on the chart.
To identify numerals and relationships	The number line area provides for many types of activities, all of which help the child to identify numerals and their relationships. The following are but a few of the limitless activities possible on a large number line on the floor. 1. Pupils draw a number from a container and line up on the point indicated by the numeral. 2. Teacher calls a name and a number. The pupil named lines up on the correct point.

Objective	*Activity*
	3. A pupil stands on 2 and moves to 5. How many points has he moved? Continue with other combinations for addition.
	4. Have pupil stand on 4 and move to 1. How many points has he moved? Continue with other combinations for subtraction.
	5. One pupil stands on 2 while another pupil stands on 6. Then see how many pupils fit between these two points.
	6. Take a domino from a box. Start at one on the number line and take as many steps as there are dots on the domino.

The foregoing activities are to be supplemented with opportunities for practical application of mathematical concepts developed. Milk money and other collections provide for rational counting and for learning coin denominations.

A store in the kindergarten classroom provides for many applications of mathematical ideas. The store should provide for unstructured learning situations and children should feel free to set their own objectives. Proper stocking and equipping of the store should assure some of the following outcomes for some of the children:

1. Weight comparison, as scales are utilized.
2. Money value, as goods are sold.
3. Linear measure, as ribbon is sold.
4. Liquid measure, as pints, quarts, and gallons. (Containers are used.)
5. Comparison of costs, as labels and charts are displayed.
6. Estimation of all kinds.
7. Comparisons of density, as the large cereal box is found to weigh less than a two-pound box of sugar.

The children can make quantitative comparison when cooking or block building. Use of rulers, balances, scales, thermometers, egg timers, and clocks can lead to more formal measurement concepts. In the block corner or in the art class, geometric concepts can be initiated and developed.

Even snack time provides a social setting for discussion of mathematical ideas.

Who has the largest apple?
How many people brought oranges?
Let's break the cookies in half.
How many bottles of milk do we need?
Are there enough straws left in the box?

The possibilities to apply mathematical learning are endless. Mathematics truly is an integral part of the total kindergarten day.

Suggested Materials for Mathematics

Montessori Unifix Cubes
Pegboards
Play Money
Store goods
Counting discs
Giant dominoes
Enlarged U. S. Coins
Cash Register
Calendar
Thermometer (inside and out)
Floor number line
Counting Bar (1-10)
Classroom Counting Frame
Bushel baskets
Pint, quart, gallon cup measures
Play telephone
Form boards (geometric insets)
Puzzles
Notation cards
Scale (balance type)
Stepping Stones—with Number Patterns
Stepping Stones—with Numerals
Colored beads and laces
Blocks
Stern Rods
Geo-D-Stix (for construction of 3-D figures)
Flannelboard cutouts
Height Chart
Clock (real and play)
Rulers
Yardsticks
Water and Sand Table
Raised numeral cards (for kinesthetic approach)
Geo-Board (for making geometric shapes using rubber bands)

Language Arts in the Kindergarten

The broad objective of the language arts program is, of course, to increase the kindergartner's ability to communicate. Listening and speaking skills are involved, as well as the discriminatory skills which are prerequisite to successful reading experiences.

The following objectives form the basis of the language arts program:

1. To listen with a purpose
2. To articulate clearly
3. To use language structure which is adequate in terms of communicating ideas
4. To increase number of words used meaningfully
5. To discriminate between auditory stimuli
6. To discriminate between visual stimuli
7. To recall sequence of events
8. To identify letters of the alphabet (upper and lower case)
9. To associate consonant sounds with appropriate letter
10. To improve skills in visual perception through use of Frostig exercises related to these skills (visual-motor, figure-ground, form constancy, perception of position in space and perception of spatial relationships)

Listening and speaking skills are, of course, developed informally throughout the program as discussions occur in the work and play situations of the classroom. Use of creative, as well as functional, language is encouraged. Correct sentence structure is reinforced. Specific activities are suggested in addition to varied informal situations for improving listening and speaking skills. Prereading skills are developed to the extent that individual ability warrants. Those children who move naturally into actual reading will find their needs met in the language experience approach utilized in the program.

Objective	*Activity*
To identify possible consequences of faulty listening	Read stories such as *Henny Penny* or *Lazy Jack,* whose plots center around poor communication due to faulty listening. Have pupils discuss other situations where unfortunate results might accompany poor listening.
To discriminate between sounds	Choose a variety of sound makers. Allow pupils to try them out. Then have pupils close their eyes or have objects placed behind cardboard screen. Make the noise and have pupils identify objects. (Object might be a triangle, rhythm sticks, balloon with air going out, etc.)

Objective	*Activity*
	Use piano and play two sounds which vary according to pitch or intensity. Have pupils describe these sounds as higher, lower, or louder and softer. Have a pupil make a sound and call on another child to make a louder sound, higher sound, etc.
	Let children use a stethoscope on their friends to compare the sound of the heartbeat with and without the instrument.
	Pupils act out *Three Bears.* Pupil asks questions such as "Who's been eating my porridge?" From pitch, others must decide if Papa, Mama, or Baby Bear was talking.
To classify sounds	Pupils close eyes for a given period of time. Then they list sounds they heard. As the teacher lists them, the pupil giving the sound must classify the sound as indoor noise or an outdoor noise.
	Use Scott Foresman listening records to identify and classify sounds. (The records are Sounds of Home, Sounds of School, Sounds of the Farm, and Sounds of the Neighborhood.) The record also has cards for matching the sound to the person, animal, or object that made the sound.
	Teacher tape records sounds in her home. When tape is played, sounds must be identified and classified as kitchen noises, living room noises, etc.
To recognize letters, numerals, colors, etc.	Make "pathway to a flying saucer." Place numbers or letters in spaces along pathway. If child can name all things on path to flying saucer, name gets placed on the saucer.
To see similarities and differences	Card game of Old Maid. Cards are distributed. Child takes card from child next to him. Tries to match it with one in his hand. When he has a set of 2 cards, he places them down. Child with most sets wins. Child left with

Objective	*Activity*
	Old Maid card loses. (May wish to vary this—child left with Old Maid card deals next, etc., to avoid losing aspect of game.) Game may be constructed of shapes, numerals, pictures with same initial consonant sound, etc.
To learn to give direct, complete answers to questions To speak clearly	Taped interviews. Teacher interviews each child, asking questions about topics in which child is interested. He might pretend he is broadcasting from radio station; e.g., "This is radio station M-A-R-K-S broadcasting from Mark's Meadow School. We are very fortunate to be able to talk with______today."
To use sequence	Movie. Each child draws and dictates a frame. It is then pieced into a group effort project.
	Tape record pupil voices. Play tape. Have pupil stand when he recognizes his own voice.
To use context	Place picture cards along chalkboard. Teacher tells a story which is about pictured objects. Each time she comes to one of these words, she stops before pronouncing it, and a child must come up and select the proper picture.
	Use brief sentences and omit endings. Have pupils supply possible endings; e.g., Because it was cold, Jack put on his______. Because Joey lost his bicycle, he felt______.
	Use riddles and have pupils solve.
	Teacher tells a two-or three-sentence story and asks questions; e.g., Mary went out to the playground with Ann. Ann had a jumprope and some marbles. Questions: Where did Mary go? Who went with her? What did Ann have?

Objectives	*Activity*
To give appropriate activity response to auditory clue	Teacher directs pupils to listen for a particular kind of word (e.g., a color word, a number word). Pupils are asked to clap when they hear this word in a listing being given by the teacher. Pupils could take over "teacher" role after a few turns.
	Pupils are given colored chips or beads of many colors. Teacher says three color names. Children must string the three colors in the order given. Teacher instructs pupils to march in time to her clapping and tells them to stop the minute the clapping stops. Any child who fails to stop goes to the end of the marching column.
	Play Musical Chairs. Pupil must hunt for chair when music stops. Each time one pupil is eliminated since there is always one less chair than children.
	Children are given various colored chips or pieces of construction paper. Teacher tells a story which has many color words. Pupils hold up correct color as word occurs in story.
	Each child is given the name of a fruit. One child is IT. He calls the names of two of the fruits and these children exchange places while IT tries to get to one of the vacant places first.
	One child is chosen to bounce ball. Another child is chosen to bounce the ball the same number of times.
	Place picture cards along chalkboard tray. Teacher says a sentence which contains two of the pictured objects. Pupil must go to chalktray and select the two pictures.
To repeat accurately	Play *I Go to the Supermarket.* First child lists one thing he would buy. Second child repeats it and adds another item. Game continues until child misses. Then a new sequence is begun.

Objective	*Activity*
	Play rhythm on drum or clap pattern for another pupil to repeat.
	Group is divided into two teams. A classification is assigned to each (e.g., colors and numbers, or toys and children). Teacher lists words—mixing the two categories. Children listen for their team's words and pupil must repeat them in the order the teacher listed them.
	Teacher whispers several sentences or phrases in a progressively softer voice. Children repeat until they are no longer able to hear.
	Children sit in a circle. First child whispers sentence or phrase to child sitting next to him. That child whispers the words to the next. When the message has travelled full circle, the last child repeats what he heard. This is compared to what first child said to determine how well they whisper and listen.
	Children become Indians. They sit in a circle. One of the braves has a tom-tom. Another brave is sent to the woods in the far corner with a tom-tom. The brave in the woods sends his message by beating his tom-tom. The brave in the circle attempts to repeat the pattern. If successful, he may go to the woods and another child takes his tom-tom.
To recognize rhyme	Pupils are instructed to clap when they hear words in a story which rhymes with a given word. (Dr. Seuss's books are excellent for this activity.)
	Use nursery rhymes and leave out the second of a pair of rhyming words for pupils to insert (e.g., Hey, diddle, diddle, the cat and the ______). Make up rhyming stories such as the following for pupils to insert logical rhyming word.
	Once there was a little mouse. He lived in a little______. Every day he said, "Oh, please, May I have a piece of______?"

Objective	*Activity*
	"Cheese," his mother then would cry, "You will get some by and______." "Right now you'd better scat, For down the street comes Tommy______."[*]
To classify kinds of sounds	For each season children make lists of sounds they hear which they would not hear at other times of the year. Or the teacher suggests sound and children place it under Fall, Winter, Spring, or Summer (e.g., dried leaves crunching, snow crunching, birds singing, swimmers splashing, insects buzzing, wind howling, etc.).
To classify	Use magazines to cut out pictures. "What would you find in a refrigerator, closet, toy chest, etc.?" Pictures placed on chart of refrigerator, closet, toy chest, etc.
	Shoebag classification. Each pocket receives a different designation. Child sorts pictures, numbers, letters or colors to the proper pocket of the shoebag.

Phonics in the Kindergarten

Auditory discrimination activities related to classroom sounds, playground sounds, musical activities, and listening activities of all kinds should precede any attempt to teach letter names and sounds and should serve as an indicator of individual readiness for this type of learning task.

For those children who appear able to benefit from this type of instruction, several methods could be used. Containers for sorting objects such as those provided by Houghton Mifflin may be used, or any variety of homemade and commercial materials. The Phonovisual Method described below is one which can be adapted for kindergarten use with activities varied in such a way to make the experience interesting for five-year-olds.

Some kindergarten teachers may utilize successfully the dictated stories of children as a basis for phonics work. This procedure is described under the Language Experience Approach to Reading.

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[*] Smith - *Creative Teaching of the Language Arts in the Elementary School*

Phonovisual Method by Helen O'Leary

Using only two simple charts, one for consonants and one for vowels, and the teacher's manual, the teacher will follow the recommended plan and begin with teaching five consonant sounds. Since there is ample time to complete this program, the teacher may use many games to enrich the introduction of sounds. Pictures, games, poetry, and class-made picture charts should be used to broaden the understanding of the children. Individual boxes—one for each consonant and each vowel sound—should be used. As the children learn the beginning sounds of *pig, wheel, fan, three, top,* and others, little objects can be placed in the box assigned to each sound. The teacher may start by showing the class a few contributions she is making.

Where shall I put the *pencil,* the *pen,* the *pin,* the *whistle,* the *thimble,* the *thread,* the *thumb tack,* the *shell,* the *doll,* the *bus,* the *box,* the *paper,* and the *yo-yo?*

As each child brings in something for the box, he tells why it belongs in a certain box.

Games can then be played, such as "I am holding something in my hand. If it were alive, it would be wriggling. It starts like *saw.*"

"I have something which would be a delicious, juicy fruit if it were real. It starts like *pig.*"

Both teachers and children may make up the riddles.

Composite charts—one for each sound—can be constructed by the children with the teacher. An advisable technique begins with the large chart with its symbol "p" and its picture *pig.* A few pictures have already been placed on the chart by the teacher—*piano, peanuts, pineapple, peach.* Then along the chalkboard are about ten pictures, only five of which start like *pig.*

After these are selected for the chart, empty spaces on the chart and invite children to find pictures on their own. Some children may of their own volition start their own books. Again, while approving and praising, the teacher puts no pressure upon those who have not started to make their own books.

The teacher should feel free to supplement the teaching of auditory discrimination by other activities which fit into the idea of fun and games. However, key words and pictures should be kept.

Additional practice can be given by using the following method—a procedure for teaching any sound.

Step 1 Have pupils listen to words all beginning with a given initial consonant.

Step 2 Have pupils contribute words beginning with the same sound.

Step 3 Have pupils identify word beginning with a different sound when that word is inserted in a series of words beginning with the given consonant.

Step 4 Have pupils answer riddles with a word which begins with the given consonant.

Step 5 Have pupils find picture of other words beginning with the given consonant.

Step 6 Consonant books could be made by pupils.

Objective	*Activity*
To identify initial consonants	Teacher lists words, all of which begin with the same sound except one. Pupils are directed to stand when they hear the different initial consonant sound. Classroom direction can be given in this manner: "If your name begins like milk, you may get your coats." "Those whose names begin like penny may get their straws first," etc. Beginning Sounds Game—Ask questions such as the following, all of which are answered by an initial consonant sound. "What sound do you make when you eat something good?" (m) "What sound does a lion make when he roars?" (r) "What sound does a snake make?" (s) "What sound does a saw make?" (z). Tree with leaf pockets—each leaf is a consonant. Pictures of words beginning with that letter sound drawn by children and word printed by teacher.

Objective	*Activity*
	Moving Day Game. Cards distributed with pictures of things found in a house. Then ask for things that start like ball, etc., to go in the moving van. Catch the Balloon Game. Balloons having consonants on them placed at a distance from the group. Word given. Child must recognize what sound it starts with and race to touch balloon. Child with most number of points wins.
	Fish Pond. Magnet game. On each fish, put action word and action picture of sound to be introduced. Children fish and do what fish says. Others may guess word.
	Simon Says. Children do whatever Simon Says if it begins like beginning sound studied. Change name of game to fit sound studied; e.g., Bobby begs for B-sound, Teddy calls for T, Carol calls for C, etc.
	Variation of candyland game. On piece of cardboard, paste phonics pictures (about 3-4 different beginning sounds) on a path to Candyland. Make a spinner. On it, paste 3-4 pictures that have same beginning sounds as those on board. Children spin and move "man" to nearest picture that begins like picture on spinner.
To learn to match pictures that have same initial consonant sound	Lotto. Make master cards with nine spaces. On the middle space, paste the key picture. On separate cards, paste other pictures that begin like the key words. Children may choose from pile. If it begins like his key word, he places it on his card. If not, another child can claim it.
	Another version is to pass out all cards. Children get rid of cards by placing them on the master cards. First one out of cards wins.

Vocabulary Development

The kindergarten classroom affords many opportunities to increase vocabulary and to use these newly acquired words in functional situations. Discussions, dramatizations, puppet shows, planning periods, choral speaking, listening to poetry and stories, as well as the writing of poetry and the use of experience charts, all provide meaningful situations for developing oral language skills. In addition to these situations, contrived experiences for vocabulary development are helpful. Activities from the following list should be used and expanded. Daily use of the Peabody Language Development Kit is recommended. Some of the following activities are taken from this kit.

Objective	*Activity*
To use a greater number of words meaningfully	Children are given a brief sentence and are asked to make a picture of that sentence (e.g., The boy stood under the tree). After pictures are drawn, the variety of interpretations are discussed and lists of descriptive words are suggested to fit a particular picture (e.g., a tall boy, a thin boy, a boy with black hair, a crooked tree, a green tree, etc.).
	Bring in pictures. Ask how the people look—happy, sad, funny, etc. Ask children what could have happened to make the person feel this way. Relate to pupils' own experience by asking about events which made them feel this way.
	Have pupils complete the following similes. See how many ways each can be completed. as hard as_____ as scary as_____ as soft as_____ as dark as_____ as gentle as_____ as bright as_____ etc.
	Go for a color walk. Have pupils describe what they see in terms of color. Back in classroom, let them paint their favorite color object from walk.

Objective	*Activity*
	Go outside on a day when there are many fluffy cumulus clouds. Have pupils lie on the ground and decide what the clouds look like. Back in the classroom make experience chart. Clouds are like ships. Clouds are fluffy pillows. Clouds are white sheep. etc. Also, pupils could paint the clouds they saw. Read the following poems to show what other people have seen in clouds. *The Sky* The sky is very far away, So blue It is; and, soft as squirrels' tails, Float over it, like little sails, Small clouds. M. Bardwell *Clouds* White sheep, white sheep, On a blue hill, When the wind stops You all stand still. When the wind blows You walk away slow. White sheep, white sheep Where did you go? Christina G. Rossetti
To introduce opposites	Have paired pictures available which show opposites; e.g., hot—cold, up—down,—stop—go.

Mix them up and have pupils pair them again in opposites, saying the words themselves. Have pupils find pictures of other opposites to add to collection.

Play game, using opposites:

Stand up—Sit down
Reach high—Reach low
Clap loud—Clap soft
Open your eyes—Close your eyes
(Peabody Language Development Kit)

Objective To respond to various parts of speech by appropriate activities

Game for prepositions—Put an object in, on, under, beside, above, or behind a box. Have pupils put themselves in position in relation to the box as indicated by preposition.

Game for adverbs—Have children move happily, sadly, quietly, noisily, etc.

Game for adjectives—Pupils pretend they are happy, sad, brave, afraid, etc.

Game for verbs—List things children can do as they make suggestions. Discuss various animals. What do they do? Make charts with pictures and action words.

Have numerous pictures for display. Have pupils label objects in picture and classify under appropriate headings. Label and classify objects around classroom.

Use pictures of people in various situations. Discuss how they feel. Talk about various emotions. Encourage pupil discussion of when he experienced the emotion.

Use pictures to provide idea for original story. Ask pupils what might have happened before and to predict what might happen next.

Cut up simple dime store story books. Have pupils arrange in proper sequence.

Ask children to look around room and name any object. Have first pupil call on second pupil to tell what the object is used for. If second pupil is successful, he may name object.

Point to named parts of body.

Clothing words—What do we wear on our feet? on our hands? at night? etc.

Snow is cold. Fire is______.
Sand is dry. Water is______.
People walk. Birds______.
(Peabody Language Development Kit)

Have pupils sit in a circle so that they can see each other's shoes. Ask children to name ways shoes are alike (e.g., all have soles, tops, heels). Then discuss how they are different.

List animals. Then discuss where each lives (kennel, shed, barn, nest, etc.). What are the baby animals called? Have pupils pair up: cow—calf; dog—puppy; cat—kitten, etc.

Have pupils finish phrases with whatever word pops into their minds: Stop and______. Pots and ______. Sweet and______. etc.

Tell me a word that tells: about the weather; the name of a child; the name of a vegetable; something you can ride, etc.

Writing Poetry in the Kindergarten

Poetry writing frequently becomes a difficult task as children progress through the grades. The difficulty occurs as children become more inhibited in expressing their feelings. Often artificial rhyme schemes, rather than the poetic idea, become the framework for these "poems." By starting poetry writing early (actual writing, of course, being done by the teacher as child dictates) children begin to use a greater variety of words to express their ideas.

The purpose of developing this skill in writing poetry is to increase vocabulary and to provide an opportunity for using more expressive types of language.

Five-year-olds are natural poets. It is the task of the teacher simply to aid the child in putting his thoughts into language. Almost any classroom activity or event can provide an opportunity for this self-expression. A seashell, raindrops, a kitten, or falling leaves— a familiar object and an idea about that object is all that's needed. What is a seashell like? Feel it. Listen to it. Is the seashell talking? What is it saying?

What are raindrops like? Yes, they are like tears, but who could be crying?

How does a kitten feel? Soft, yes. As soft as what?

How do leaves fall? What else might fall like that? A ball? A feather?

Begin with discussions or play little simile games. These can be developed into brief images which are far more poetic than the artificial rhymes so often produced by older children when asked to "write a poem."

One effective way to begin children thinking in terms of similes and metaphors is to display two pictures of things, which may look alike, sound alike, or feel alike.

Display a picture of a cloud and a ball of cotton. How are these alike? Soft, fluffy, white, etc. Lead children to put the image in words. "A cloud is fluffy like cotton."

Or use a picture of a moon and a silver dollar. Assist children in making comparisons, until they are able to express themselves and to verbalize these comparisons independently. Perhaps one will say, "The moon is shiny and round like a silver dollar."

Or use a picture of a lion and the sea (a bit more difficult). Guide pupils by asking such questions as: What sounds do they make? What word could describe both? With the possible response of "Roar," the following image might be written. "The sea roars like a lion."

In her book *Let Them Write Poetry,*[1] Nina Willis Walters suggests the following steps for helping children to build images. Kindergarten teachers would do well to stay at step one for some time and move gradually to step two. Steps three and four may be within the linguistic or imaginative skill of some kindergartners, but would certainly be inappropriate for all.

Building the Image

1. What is it like?
2. How are the two things alike?
3. Of what does it remind me?
4. How do I feel about it?

Building images, which are actually poems, must, of course for the kindergartners, be related to concrete experiences, but a teacher alert to these creative opportunities certainly could provide the necessary motivation for these young poets.

Choral Speaking

Choral speaking is another important activity of the language arts program. It has social and emotional significance in that the shy child, who frequently will not recite or perform individually, will participate in this group experience. Choral speaking also requires use of good listening skills in order to join in at the appropriate time.

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[1] Walters: *Let them Write Poetry,* Holt, Rinehart and Winston. p. 32

There are four types of patterns for choral speaking which may be utilized:

1. *Refrain.*

Children: Hickety, pickety, my black hen
Teacher: She lays eggs for gentlemen.
Sometimes nine, sometimes ten.
Children: Hickety, pickety, my black hen.*

2. *Line-a-child*

"Bow-wow" says the dog;
"Mew-mew" says the cat;
"Grunt-grunt" says the pig
And "squeak" says the rat.
"Tu, whu" says the owl;
"Caw, caw" goes the crow.
"Quack, quack" goes the duck
And "moo, moo" says the cow.*

3. Groups speaking in antiphonal fashion. Two groups take turns in dialogue. In this example, one asks questions while the other gives answers.

All: Three little mice sat down to spin,
Pussy passed by and she peeped in.

Group 1 — "What are you doing, my little man?"

Group 2 — "We're making coats for gentlemen."

Group 1 — "Shall I come in and bite off your threads?"

Group 2 — "No, no, Miss Pussy, you'll bite off our heads."

Group 1 — "Oh, no, I'll not. I'll help you spin."

Group 2 — "That may be so, but you don't come in."* *

4. Two groups speak simultaneously, but one recites verse, while other does a correlated, repetitive chant to the rhythm of the poem. (e.g., one group could recite the nursery rhyme "Hickory, Dickory, Dock" while the other group says "Tick-a-tick, Tick-a-tick-tock.")

Creative Dramatics

Teachers may read stories which children can spontaneously act out. Children should be encouraged to use their own words and to talk and act like the characters. A certain area of the kindergarten can be set aside for the theater. Ideally, a small stage lends itself to acting and performing. Properties and furnishings are not important.

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* Dawson-Newman: *Language Teaching in Kindergarten and the Early Primary Grades.* Harcourt, Brace & World.
**Ibid.*
****Ibid.**

Mimetics provide another opportunity for creative expression. Careful observation, discussion, and comparison of types of movements must precede the introduction to mimetics.

Mimetic activities can be introduced by asking children about common experiences. "How do you walk when you're coming to school?"

"How do you like to move on the playground?"

"What do you do at home to help Mom or Dad?"

After a number of responses, the suggestion that some of these be pantomimed could be made.

A visit to the zoo or the farm in which the ways animals move is carefully observed could serve as an introduction. A film of animals in natural habitats or a circus film is also suggested.

Clarice Dechent Wills and Lucille Lindberg, in their *Kindergarten for Today's Children,* give the following excellent list of possible subjects for mimetics:

Subject	*Activity*	*Condition to suggest feeling and interpretation*
Animals	elephants walking	in a circus parade
	rabbits hopping	hiding Easter eggs
	birds flying	in spring sunshine
	cats stalking	a mouse
	chickens pecking	looking for breakfast
	horses galloping	in a race
	frogs jumping	to escape a boy who is trying to catch them
	snakes slithering	silently in the grass
	monkeys playing	for the people at the zoo
	salmon swimming	upstream
Working	climbing a ladder	to put out a fire
	sawing a tree	for Christmas
	chopping wood	for a beach campfire

Subject	*Activity*	*Condition to suggest feeling and interpretation*
	digging	to find clams
	loading a truck	with toys for poor children
Helping at home	mowing the lawn	to make the yard prettier
	sweeping the house	before company comes
	painting a wall	clean, bright yellow
	ironing	a party dress
	climbing the stairs	to bed
Fun	pulling a sled	over the snow
	swimming	on a cold day
	rowing a boat	to a good fishing spot
	doing a trick	for Daddy
	riding a tricycle	to explore the neighborhood
	hiking up a mountain	to see the sunrise
	skating	up a steep hill
	ice skating	on a slippery pond
	jumping rope	in trick ways
Vehicles	jet planes taking off	at the airport
	boats rocking	on a rough bay
	freight trains chugging	up a mountain track
	space ships orbiting	around the moon
Characters	giants walking	through a city
	fairies tiptoeing	past a sleeping body
	clowns tumbling	at a circus performance

Subject	*Activity*	*Condition to suggest feeling and interpretation*
	soldiers marching	in review before a general
	goblins dancing	on Hallowe'en night
	dolls walking	helped by a girl
	tired boy	awaking in the morning
Nature	trees swaying	on a windy day
	rain pelting down	during a thunderstorm
	wind blowing	on flying kites
	leaves floating down	in autumn wind
	flowers growing	in spring sun and rain

Speech

by Anne G. Cann
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Speech, language, the child's self-concept and his approaches to learning are intimately interrelated. Speech and language are the primary tools both in self-expression and in conceptual development. Thus a language arts program for kindergarten age children should stress a variety of objectives for total integration of social and cognitive growth.

Although the grammar of the child is well developed by kindergarten age[1], the phonology is still in a transitional stage in many children. Most children can produce the (f) and (v) sounds accurately about age five; the (l) and (r), (zh) and (ch) sounds are still developing into the sixth year; and the (s), (z), (sh) sounds as well as the consonant blends are usually produced accurately at the beginning of the seventh year[2]. Thus distortions, substitutions and omissions of consonant sounds are not uncommon. A well-rounded language arts program in which there is plenty of opportunity for verbal expression without specific correction of consonant errors is recommended for children with few mild and age-appropriate consonant errors. If special emphasis for improved auditory discrimination and consonant production is desired, there are several programs designed for groups with these objectives. The Listen-Hear Series[9] and the Jr. Listen-Hear Series[10] as well as the Speech Improvement Curriculum Guide[11] by Byrne can be recommended.

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[1] *Children and Oral Language,* National Council of Teachers of English, 1964

[2] Wood, Nancy, *Delayed Speech and Language Development,* Prentice-Hall Inc., Englewood Cliffs, New Jersey, 1964, p. 12

If speech intelligibility is impaired and there are numerous distortions and omissions of consonants and vowels, the child should be referred for a complete speech, hearing, and language evaluation.

Sometimes children of kindergarten age exhibit hesitancies and repetitions in speech which are labeled "stuttering" by adults. Actually, this is quite a usual stage in the development of speech and language. If such a pattern appears, an approach in which there is plenty of opportunity for verbal self-expression without reminders to "slow down" or to "take a breath before speaking" will help the child through this normal stage. There may, however, be cases in which the fluency is severely disrupted and these should be referred for thorough evaluation.

Perception

Perception is now recognized by psychologists and educators as one of the prime psychological functions. Perception is defined as the recognition and organization of stimuli.

Marianne Frostig states that the period of maximum perceptual development occurs between the ages of three and a half and seven and a half years of age. Perceptual lags which may occur are irrespective of intelligence.

The perceptually handicapped child is usually clumsy at very routine activities. Because of his difficulty, his performance is unstable and unpredictable. Frequently he becomes a remedial reader as he progresses through the grades.

The year in kindergarten is extremely important in the area of perceptual training. Frostig-type exercises are used in physical education. Frostig worksheets are also used with pupils as a preventive program. Those pupils who appear deficient in any of the five areas of visual perception, as identified by use of Frostig materials, are given concentrated training in this area. The five areas so identified are visual-motor, figure-ground, perceptual constancy, perception of position in space, and perception of spatial relationships.

At the end of the kindergarten year the Frostig and/or the Beery Test for identifying those pupils with perceptual difficulties will be administered. Those pupils who still appear to have problems of this nature will be recommended for a more structured approach to reading in grade one—an approach in which consistency of sound is stressed and in which sight vocabulary, configuration, and picture clues are minimized.

Language Experience Approach to Reading

by Dr. Helen O'Leary

The language-experience approach for development of pre-reading skills can be very effective.

For use at the kindergarten level this method of promoting linguistic facility is highly recommended. Through acquaintance with many areas of information, all children will find some thought-provoking situations inviting comments, contributions, and ideas.

Here is how the language-experience approach operates:

1. Children are stimulated to become interested, curious, and talkative about an activity which the teacher has arranged for them to experience and appreciate.
2. Conversation, discussion, and questions about their common experience provide the background for the contribution of ideas.
3. With the teacher as secretary and editor, a composite chart includes the statements and questions from the children.
4. The teacher usually constructs the chart with the children but she often considers it necessary to enlarge or condense their ideas.
5. The teacher brings the completed chart to class the next day. The teacher reads the chart.
6. The chart may be placed for a limited time on the bulletin board. Children's illustrations may surround it.

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[9] Slepian, Jan and Ann Seidler, *The Listen-Hear Series*, Follett Publishing Co., Chicago, 1964

[10] Slepian, Jan and Ann Seidler, *The Jr. Listen-Hear Series*, Follett Publishing Co., Chicago, 1967

[11] Byrne, Margaret, *A Speech Improvement Program for Kindergarten and First Grade*, Harper & Row, New York, 1965

7. According to the nature of the experience, one, two, or more charts may evolve from the children in the same way.
8. The charts may be reread for the children if a purposeful occasion arises.

Since these experience charts at the kindergarten level are not usually read by the children, the vocabulary does not need to be restricted or controlled. This does not necessarily mean that these charts will not be read by some children. The teacher, however, will not pressure children in any way. The desire to read, left-to-rightness, vocabulary growth, general information, and the opportunity to contribute ideas will be fostered and stimulated by this approach to readiness.

If the time comes at some point during the school year, the teacher, noticing many pupils' desires to read, may, without announcement, control the vocabulary, introduce words several times in the same chart, and possibly include words to be met in the pre-primers.

Another activity, related to visual discrimination, may be incorporated when the teacher makes two copies of the chart. With the second chart cut in strips, the teacher may allow children to put it together to match the first one. No reading again is required, but the teacher may intentionally say, "Yes, that is the second line which says, 'We saw bears, lions, and tigers.' "

Many situations lend themselves to chart construction.

A trip to the park may result in a series of interesting observations. Probably the squirrel family could provide enough information for an entire book. How many in the family and who they might be, how they look, how they climb, how they play, what they eat, where they live, and what they think of us could be some of the areas explored. Children could supply illustrations, choose a title for the book, and hear and see the teacher show and read the book to visitors.

A visit to a turkey farm before Thanksgiving will supply background and understanding for much poetry and many songs. In addition to the charts relating specifically to the excursion, poems and songs should be on charts also.

A tour of a supermarket can enable children to list in categories things they saw. This is a simple lesson in outlining under the major heading: WE SAW MANY KINDS OF FOOD.

See what children can recall seeing under various headings, such as *Fruit, Meat, Fish, Vegetables, Pastries,* and others suggested by the children. (Some of these recalled under the teacher's guidance could be Dairy Products, Frozen Foods, and Canned Goods.)

Sometimes trips can be made within the school. For example, a trip around the school to discover different kinds of workers may acquaint the children with the principal, the teachers in the various grades, the custodians, the school nurse, some of the supervisors, and the clerical staff. Children after the trip may choose certain members and with the help of the teacher may describe and illustrate their work. Some of these completed charts could be presented to the people they have represented.

Since trips will not always be desirable and feasible, very simple environments may suffice. A bowl of goldfish, a pair of turtles, an interesting puppet, a new toy, a party in the planning stage, holiday ideas, an original story, notice of a dramatization and charts related to it, and favorite songs may be some of the motivating devices for beginning charts. In all these cases illustrations may be supplied by the children to accompany the manuscript writing by the teacher.

A science unit on snowflakes or a social studies unit on kinds of homes for people or a safety unit on playground equipment, a holiday unit on a toy shop, a valentine party, or a parade may also initiate charts.

In the late spring the teacher may venture into a more ambitious type. Bringing in a tricycle, a wagon, a child's car or tractor, or some other type of conveyance, the teacher, with the children's ideas, composes charts about the arrival, the appearance, the dangers, and the proper use of the car or conveyance. The opportunity to get a license may be offered. Certain conditions for successful application are necessary. The ability to write your own first and last name, your age, and your father's first name, the knowledge of when your birthday is, of where you live, of your teacher's name, of your principal's name, and the name of the school which you attend—these would be the kinds of information children would be expected to acquire. Individual charts dictated by a child to a teacher would be beneficial. Opportunities for role-playing would be obvious. However, again no pressure is used to see that all participate.

Actual road tests on the marked-off area on the playground would take place. The ability to react to signs like *Go, Stop, Slow, Right, Left, Blow Horn,* and *Park* would be the procedure to follow for success.

Language Experience Approach

As outlined by Dorris M. Lee and
R. V. Allen in their book, pp. 5-8,
Learning to Read Through Experience

These authors list the following reading concepts which develop through use of the experience approach and describe the sequence of concepts in this manner:

1. What a child thinks about he can talk about.
2. What he can talk about can be expressed in painting, writing, or some other form.
3. Anything he writes can be read.
4. He can read what he writes and what other people write.
5. As he represents his speech sounds with symbols, he uses the same symbols (letters) over and over.
6. Each letter in the alphabet stands for one or more sounds that he makes when he talks.
7. Every word begins with a sound he can write down.
8. Most words have an ending sound.
9. Many words have something in between.
10. Some words are used over and over in our language and some words are not used very often.
11. What he has to say and write is as important to him as what other people have written for him to read.
12. Most of the words he uses are the same ones which are used by other people who write for him to read.

Obviously, many of the above concepts are too difficult for all but a few kindergartners. The first three concepts are appropriate to most five-year-olds. The kindergarten environment is one

which encourages use of expressive language. The child is encouraged to use a variety of media to express his thoughts: painting, clay, collage, other art media as well as dictation, which the teacher records. On the basis of these stories, the sensitive teacher can assess readiness for more difficult concepts. When a child notices that five words in his story begin the same way, it would be appropriate to begin work with that particular initial consonant. In future stories, as the child dictates, he would tell the teacher what letter to begin the word with when the initial consonant sound was one that he had already learned. The alert teacher will be quick to recognize increasing auditory perception as that consonant is recognized in final or medial position. Phonics then can be truly integrated into the language approach with supplementary activities used as follow-up learning experiences.

Dictation can be entirely an individual experience with individual booklets being made and typed or the stories can be an outgrowth of group discussion.

It is the function of the kindergarten to provide a wealth of interesting experiences so that the child has a variety of things to tell about. Discussion periods should be handled in such a way that each child feels security and freedom to express his own ideas.

Open-ended sentences may serve as a stimulus for creative thinking.

If cows could fly, I would__________.

On the way to school I saw__________.

I am very happy today because__________.

On Hallowe'en I will__________.

If I were as big as a giant__________.

If I were as small as an ant__________.

Booklets could be constructed around a certain title, with each group member contributing an illustrated page, which could simply be labelled or on which the teacher could write a sentence or two dictated by the child.

Titles might be:

What We saw On Our Trip to the Post Office
Animals Come In All Sizes
Some Things Are Square
A Counting Book
Funny Dreams

Snow Stories
My Noisy Book
My Quiet Book

The climate of the kindergarten is conducive to this highly individualized free expression. The advantages of this type of introduction to reading are many. Lee and Allen refer to this as an "open" method of reading instruction and list the following strengths of the approach.

1. Centered in the learner's recognizing that his speech can be recorded in print.
2. Emphasis on developing reading skills as part of the total language experience.
3. Subject matter emerges within the classroom as children record their own thinking through writing and other media.
4. Reading instruction program controlled cooperatively by learners, teacher, and "readers" during the learning situation.
5. Emphasis upon building habits and skills of reading as integral parts of larger experiences, especially aspects of communication.
6. Emphasis on improving understandings of what reading is and how it is used in the process of learning.
7. Emphasis upon variability in exposures to learning situations and variability in the results expected and achieved.
8. Judging pupil progress by observing development of self-expression and interest in reading and writing.*

Language experiences to be developed as suggested in *Language Experiences in Reading* by Roach Van Allen and Claryce Allen are:

1. Sharing experiences
2. Discussing experiences
3. Listening to stories
4. Telling stories
5. Dictating words, sentences, and stories
6. Beginning to write independently
7. Authoring individual books

All children can participate in some of these activities. Many children in kindergarten may do all of these. The most important aspect of the language experience approach is that each child meets success.

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* Lee and Allen—*Learning to Read Through Experience,* pp. 4 and 5

The above-mentioned books provide a wealth of activities to incorporate into a language experience approach.

1. Draw self-portraits or look in mirror. Dictate stories about describing self.
2. Read poems about friends such as *Us Two* by A. A. Milne. Discuss friends. List friends. Make a Friends booklet.
3. Child pantomimes things he does before coming to school. Others guess. Dictate list. Illustrate and complete story "Before school I________ ________."
4. Discuss clothing and weather. Relate the two. Have the children dictate stories about weather they like and dislike and why.
5. Compose stories about sounds around the home or sounds in nature. (These may be related to initial consonant work if pupils are ready for this step.)
6. Make word charts; e.g., color words, things that go, kinds of animals, etc.

The story the child "writes" is his. This approach to reading is unhurried, smooth, and individualized in the truest sense. The content can be as varied as the background and experiences. It is the role of the teacher to provide many and varied experiences and to accept stories dictated in the language of the child without editing.

The following basic sight vocabulary list may be helpful for word recognition activities as the child notices that certain words are used many times in his writing. The teacher may wish to call particular attention to these basic words in context.

This list of 220 words, prepared by E. W. Dolch, makes up from 50 to 75 per cent of all ordinary reading matter exclusive of proper names.

a
about
after
again
all
always
am
an
and
any
are
around
as
ask
at
ate
away
be
because
been
before
best
better
big
black
blue
both
bring
brown
but
buy
by
call
came
can

carry
clean
cold
come
could
cut
did
do
does
done
don't
down
draw
drink
eat
eight
every
fall
far
fast
find
first
five
fly
for
found
four
from
full
funny
gave
get
give
go
goes
going
good
got
green
grow
had
has
have
he
help
her
here
him
his
hold
hot
how
hurt
I
if
in
into
is
it
its
jump
just
keep
kind
know
laugh
let
light
like
little
live
long
look
made
make
many
may
me
much
must
my
myself
never
new
no
not
now
of
off
old
on
once
one
only
open
or
our
out
over
own
pick
play
please
pretty
pull
put
ran
read
red
ride
right
round
run
said
saw
say
see
seven
shall
she
show
sing
sit
six
sleep
small
so
some
soon
start
stop
take
tell
ten
thank
that
the
their
them
then
there
these
they
think
this
those
three
to
today
together
too
try
two
under
up
upon
us
use
very
walk
want
warm
was
wash
we
well
went
were
what
when
where
which
white
who
why
will
wish
with
work
would
write
yellow
yes
you
your

Suggested Materials for Language and Arts program

Ginn Readiness Kit A
Ginn Readiness Kit B
Peabody Language Development Kit
Large Assortment of Pictures
Collection of clothing for dramatics and role playing
Raised letter cards, upper and lower case (for kinesthetic approach)
Phonovisual Charts
Houghton-Mifflin object containers (for initial consonant sounds)
Form Boards
Filmstrips (See AVA catalogue. Weston-Wood collection excellent)
SVE illustrations (See AVA catalogue)
Scott Foresman Talking Alphabet
Scott Foresman Talking Story Book
Scott Foresman Talkstarters
Scott Foresman Listening Records (for auditory perception)
Large collection of picture books and story books
Large collection of records
Frostig Visual Perception Program
Flannelboard cutouts
Puppets
Lee and Allen—*Learning to Read Through Experience*

Science for Kindergarten

"There is no other beginning of learning than wonder," said Plato. Surely the five-year-old comes to the kindergarten brimming with wonder. It is the teacher's task to encourage this natural curiosity and to guide children in a constantly growing understanding of the world in which he lives.

Helen Robison and Bernard Spodek, in their book *New Directions in the Kindergarten*, recommend two recently developed science programs as "far more extensive and significant... than have been available heretofore." One of these, the Science Curriculum Improvement Study series (SCIS) developed at Berkeley under the directorship of Robert Karplus, was recently adapted for use in the primary grades in Amherst schools. The series is based on a conceptual scheme. The other recommended series was developed by the American Association for the Advancement of Science (AAAS) and is a process approach to the study of science.

The key concepts of the SCIS program are: (1) that matter exists and has properties, and (2) that life is possible only in terms of a given organism - environmental relationship (ecosystem).

The AAAS program is based on the development of the scientific process in the explorational activities of the young learner in which he "makes careful observations and measurements. He tabulates and plots his data. He makes calculations. He infers relationships, makes predictions based on his observations, tests these predictions and devises mental models to explain the phenomena he has observed. He communicates his results to others in a variety of ways." [12]

These two programs were examined, portions selected, and other activities added to supplement the program.

The teacher must train children to observe closely. She should encourage a multi-sensory approach to observation. How does it look? How does it feel? How does it smell? Does it make a noise? Would it be all right to taste it? If observation is of a phenomenon rather than an object, pupils should be encouraged to describe with accurate detail the scientific event. Comparisons can then be made by experimenting with other objects or happenings. The teacher aids conceptual learning by helping children look for relationships: likenesses and differences, causes and effects. As children perceive these relationships, they can order or classify much of their environment. On the basis of these observations, children should be encouraged to form generalizations and predict outcomes.

Throughout the scientific investigation, the teacher should avoid making statements and should aid the children in discovering by asking guiding questions.

A science table or a "do-it-yourself" experiment center is a must in every kindergarten room. This table should be stocked with a variety of materials which will permit a variety of discoveries within the framework of the two broad concepts of matter and of the ecosystem.

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[12] American Association for the Advancement of Science, *Science—A Process Approach* 1963 p. 201

Water and sand play are excellent activities for reducing emotional tension, providing for social interaction, as well as affording much in the way of exploration and concept development. Volume comparison, evaporation, force of moving water, floatability, conservation, and a myriad of other learnings may develop from their use. Free play should supplement and complement all structured lessons in science as well as in all other areas of curriculum.

Either a unit approach or the episodic approach described by Robison and Spodek are acceptable vehicles for developing concepts. Their criticism of the unit approach for very young children is that it often is an effort to wrap too many concepts into a neat package. If a unit approach is used, care should be given to selection and identification of a very few concepts. Episodic learning, on the other hand, is the treatment of a given concept, which is dealt with repeatedly in various learning situations.

The specific learning activities are listed in a brief form, but should be expanded according to pupil interest. Activities should be developed by use of the scientific method of observing, perceiving relationships, classifying, generalizing, and predicting. Each should be developed within the broad framework of key concepts.

Objective	*Activity*
To use "object" as term referring to a piece of matter	Introduce term object to describe balls, desks, etc., around the classroom. Have pupils list objects in classroom, on playground, in their home, etc. Describe each, using several senses.
To identify objects in environment	Discuss non-objects such as love or hunger.
To contrast objects and non-objects	Mix objects and non-objects in list and ask pupils to sort.
To describe objects in terms of properties	Provide many opportunities for observation and manipulation of objects. (Be sure to include living and non-living objects.)

Objective	*Activity*
To sort	Go on a field trip in area surrounding school. Give each child a paper bag. Ask them to collect a given number of objects. Emphasize that each work individually so that a variety of objects is collected. Back in the classroom have children spread out objects and examine them. Tell them to decide on one property and sort accordingly (e.g., color, hardness, shape, etc.) Some objects may fall in an "undecided" category, which will provide for group thinking and discussion. Label trays of objects according to properties. Use child's descriptive words.
	Have collections of buttons which children may sort according to size, shape, color, etc.
To learn that objects may be sorted by many different properties	Sit in a circle. Children remove shoes and place them in center. Teacher asks how we might sort these shoes so that all the shoes in each pile are alike in some way. If ideas are slow to come, ask, "Are all these shoes the same color?" After shoes are sorted by color, ask "Is there still another way these objects may be sorted?"
To compare properties of objects To locate two objects with a common property	Put a variety of geometric shapes or objects in a bag. Each child draws five objects. Each child then attempts to form matched pairs according to any property he chooses. Game proceeds as each player draws one object from the grab bag. The first player to match all his objects wins. (Can be played with the requirement that matched objects must be identical—all properties matching.)
	Display variety of wood, metal, plastic objects. Have pupils sort according to material.
	Collect rocks. Have children describe their shape, texture, color. Crack open rocks and compare exposed surface with worn, unbroken surface. Discuss reasons for smooth surface. Rocks which appear to contain only one material could be separated from those which appear to contain more

Objective	*Activity*
	than one material. Keep rocks available for sorting and resorting during free play time.
To compare objects and place them in serial order	Begin by comparing two objects that are not equal in regard to a particular property, (e.g., aluminum foil and paper). Which is shinier? Which is less shiny? Clay and a rubber ball. Which is bouncier? After much practice in comparison of two objects, move to a larger set of objects and arrange in serial order; e.g., dowels, pencils, crayons, arranged from shortest to longest. Blow up balloons. Arrange from smallest to largest. Arrange children according to height. Arrange colored geometric shapes of varying shades of color from lightest to darkest. Use balance scale to weigh objects and arrange from lightest to heaviest.
Senses	
To classify objects into those having an odor and those not having an odor	Give children two pieces of cloth as different in as many ways as possible. Have one perfumed and the other not. Have children list all the ways the two pieces of cloth are different. (Conclusion: These materials look different and smell different.)
To identify groups of objects as having similar or different odors	With all safety precautions about keeping the face a safe distance from glass, have children smell a glass of water and a glass of alcohol after discussion has brought out the identical appearance of both. (Look the same, but are different.) Compare two glasses of vinegar (one white and one cider). Have children make observations. (Smell the same, but look different.)
	Lead children to conclude that appearance does not tell anything about smell and vice versa. Additional experimentation is suggested to strengthen concept.
	Follow-up activity. Have children blindfolded. Identify objects by smell only. (e.g., onion, orange, peanut butter, etc.)

Objective	*Activity*
To identify and distinguish between different tastes	Have pupils experience sweet, sour, and salty by having them eat four small pieces of bread—one plain, one with sugar on it—one with salt on it and one with lemon juice on it. Sample other foods and categorize; e.g., grapefuit, honey, salted crackers.
To compare sounds according to amplitude, pitch, duration	Have pupils close eyes. Drop a book from two heights. Which is louder? Which is softer? Have children experiment with dropping objects from various heights. They can make louder and softer steps, claps, etc. Use story *Billy Goat Gruff* to compare loudness of the three goats as they trip-trap over the bridge. Roll a wooden ball or marble along the floor for a short distance, then for a longer distance, while pupils' eyes are closed. Ask them to compare the sounds. Using a piano, or pairs of rhythm instruments, or pairs of children's voices, ask others to determine who sang or produced the lower and the higher tones. Ring a bell and rap on a desk with knuckles. Ask pupils to compare these sounds. Make other sounds and have them determine whether the new sound is more like the bell or the slap.
To amplify voice through use of simple materials	Have pupils talk with and without use of paper funnel (megaphone) and compare amplitude.
To compare intensity of sound as it travels through various media	Hold a stop watch at a given distance from pupil's ear—a distance at which the ticking is barely audible. Then place the watch on a wooden table and have a child place his ear on the table. The distance should be the same as in the first part of the experiment. Have children compare the sound. Discuss reason for difference. Tie two cans together with a long string. Invite child to speak into one can while another child listens in the other. Have children compare amplitude with and without use of this device.

Objective	*Activity*
To identify and compare sounds	Play Scott Foresman records Sounds of Home, Sounds of School, Sounds at the Zoo, and have pupils listen carefully to make proper identification.
To learn that our ears help us communicate	"Talk" to class by just moving lips. Let children try to lip read. Discuss the difficulty of communicating without hearing.
To learn that our sensations of hot and cold may differ, depending on temperature of object used as a reference point	Place 3 containers of water near children (cold, very warm, lukewarm). Have one child (a) place hand in cold water, (b) then in lukewarm water (it will feel hot). Have another child (a) place hand in warmest water, (b) then in lukewarm (it will feel cold). Discuss why opinions differ about the temperature of lukewarm water.
To identify objects by touch	Blindfold a child and place a familiar classmate in front of him. Child tries to identify him by touch.
To learn that senses help him know position	Blindfold child and put him in a wagon. Ask while moving if he knows when he's going faster or changing directions. What senses did you use?
To summarize experiences with senses	Use charts to list or to affix pictures, illustrating things we learn about with each of the five senses.
To learn that small things look bigger when we magnify them and that the amount of magnification can be changed	Fill a plastic bag with water and place bag on newspaper. Let children experiment with magnification by changing shape of bag.
To observe change in the form of matter and to identify reversibility as a characteristic of this change	Provide equal cubes of clay, butter, and ice. Have children note equality of size and shape. Place them on a hot plate. Have children observe which one melts first, second. And what about the clay? Place cubes in freezer or outside the window in winter weather. Have pupils note change from liquid back to solid. Allow experimentation with different materials under supervision of an aide.

Objective	*Activity*
	Make gelatin. Place in cool spot. Re-heat and note reversibility of change. Is gelatin frozen when firm? Through cooking, change form of popcorn, spaghetti, pancakes, etc. Is this change reversible?
	Observe a candle. Identify it as a solid. Light it and watch wax melt. Blow out the candle and observe solidification of wax.
To identify principle of conservation	At water table have children experiment with pouring a given amount of water into containers of various shapes. Ask children if the amount of water is the same after the distribution into various containers. Have them pour the water back into the original container and ask them if the amount of water remains the same. (The five-year-old is often unable to conserve. It is suggested that experiments of this type be carried on throughout the year. Viewing of film on Piaget experiments, available from science personnel in School of Education at University of Massachusetts, is recommended for teachers.)
To compare temperatures	Color code an ordinary classroom thermometer by covering numbers with three or four colors. Have containers of water of varying temperatures. Color code these to match code on thermometer. Insert thermometer in pans. Have children describe how the water felt which made the thermometer go up. (Be sure temperature is safe for feeling.) What made thermometer go down? Lead children to discover color code relationship. Then have pans arranged from hottest to coldest. Have children read outdoor and indoor thermometer and record temperature according to color code. Have children record temperature on a rainy day and on a snowy day. Lead them to discover why on certain days it snows, rather than rains. Have them melt snow in classroom and discuss reason why melting occurs. Lead them to identify snow as another form of water. Have children taste cold fruit juice and water from bubbler. Ask which is colder. Check by using color-coded thermometer.

Objective	*Activity*
To compare temperature in relation to types of weather	Have a classroom thermometer and an outdoor thermometer. Some may be able to read numbers to record, others may use color code or simply identify idea of the up and down of the mercury as representing hot and cold.
To record data	Record type of weather daily with picture cutouts on calendar: sunny, cloudy, rainy, etc.
To identify seasonal changes and adaptive effects of these changes	Compare summer and winter clothing. Compare the trees in various seasons. What do birds do in the winter? Plot migratory flights on globe. Identify importance of a bird feeder in winter and construct feeder. Record "visitors" to feeder. Ask pupils to observe changes in their pets' fur as winter approaches. Make picture charts of what various animals do in the winter.
WATER To identify and to list some of the properties of water	1) Water dissolves some solids. Obtain sugar, salt, powdered milk, and instant cocoa. Place each of these materials into separate pans of water. Observe that these solids dissolve into the water.
	2) Some objects float on water. Provide a large assortment of objects. Have some objects that will float and some objects that will not float. Let the children experiment with these objects at the water table. Lead the children to discover that size is not a determinant of floatability.
	3) Water evaporates. Set a saucer of water in the sun or observe puddles after a rain. After a period of time, again observe the saucer of water or puddles. Ask the pupils what has happened to the water. Discuss rain, where it comes from, and evaporation. List the sequence of events in the water cycle. Discuss what happens to Mother's wash on the line.
	4) Water evaporates. Drops of vapor form. Thoroughly wash and dry a fishbowl. Place a shallow container of water in the fishbowl. Put a piece of

Objective	*Activity*
	glass over the bowl and let it stand overnight. As the water evaporates, drops of vapor will condense on the glass cover. Carefully tap the glass, and you will cause it to "rain" inside the bowl. The moisture collected on the glass is like the moisture in the clouds. When clouds are disturbed or move through cold air and can no longer hold moisture, then we have rain. 5) Water can be transformed from a liquid to a solid. Partially fill a paper cup with water and mark the water line on the cup. Place the cup in the freezer. After a reasonable time, check the cup. The water will freeze into a solid block of ice. Compare the level of the ice with the original water level. Allow the ice to thaw and note the water level. 6) After a snowstorm, fill a glass bowl with snow and bring it indoors. After a time, observe the bowl of snow. What has happened to the snow? Does the water fill the bowl? Discuss snow. What is it? Where does it come from? What happens to it on a warm day?
MAGNETS **To identify and list some of the properties of magnets. To identify some of the effects of magnetism**	*Magnets will attract iron.* Place assorted magnets on the science table with various other objects such as chalk, eraser, pencil, paper, thumbtacks, common pins, paper clips, coins, nails, crayons, etc. Allow the children to experiment with these objects and the magnets. Ask the children to identify and list ways in which magnets are used in our homes. Examples: can openers, knife racks, cabinet door fasteners, refrigerator door fasteners, toys, etc. *Magnetism acts through many substances.* Use tacks or paper clips. Place table top, paper, or cardboard between these metal objects and the magnet. Have children observe the "pull" as objects move when they move the magnet.

Objective	*Activity*
	Magnetism can be transferred from one magnetic substance to another. Have pupil rub a screwdriver with a magnet. Now hold the screwdriver over some nails. The screwdriver, newly magnetized, will pick up the nails. Magnetic force can be made to work for us. Place a paper clip in a paper boat. Put the boat in a basin of water. Move a magnet directly over the boat and observe what happens. Due to magnetic force, the boat will move.
AIR To identify and to list the properties of air	*Air occupies space.* Wad up a paper towel and press it into bottom of a glass. Lower the glass, mouth downward, into a large container of water. Remove glass from container and take paper towel from the glass. The children will observe that the towel is still dry. Water could not enter the glass since it was already filled with air. Repeat the procedure, this time tipping glass after it is submerged. Note escape of air bubble and entry of water into glass. Pour dry soil into water. Bubbles will rise. Pupils discuss where this air is coming from (between the soil particles) and why bubbles are rising (water forcing air out). Go for a walk after a rain and observe earthworms. Discuss why they have come to the surface. What has happened to the air they need to breathe? Duplicate experience in large jar containing soil and earthworms. Add water and observe earthworms coming to the surface. Use water table and blow soap bubble. Use an eyedropper or baster at water table or sink. Squeeze bulb underwater. Note bubbles of escaping air. *Air is invisible unless viewed as bubbles.*

Objective	*Activity*
	Fill a large jar with cold water. Cover and place in window. Air bubbles will form on sides of the jar as it escapes the water. Dissolve sugar in water. Discuss fact that air in the same way is dissolved in water. Blow through a straw. Can anything be seen coming out of the straw? Have a child place his hand in front of the straw as you blow through it. Can the child feel anything? Now place one end of straw in water. Again blow through straw to show bubbles of air in water.
	Air moves. Make a pinwheel. If it is a breezy day, have children take their pinwheel outside. Children will discover that wind (moving air) will cause their pinwheels to spin around. Running will also cause pinwheel to spin. If it is not a breezy day, a fan could be used as a source of air.
	Observe kites, clothes, smoke, trees, etc., on a windy day. Read *Wind* by Robert Louis Stevenson or *Who Has Seen the Wind?* by Christine Rossetti.
	Air pushes and supports objects. Use a bicycle pump to inflate a tube.
	Have children take a large sheet of cardboard. Hold it facing the wind. Have them describe the "push." Place a book on a collapsed balloon. Inflate balloon and observe how it lifts book.
	Use jumping toys with bulb which is squeezed to make toy jump. Pupils drop objects and note how fast they fall. Next tie a toy parachute on objects before dropping. Discuss difference in speed and why the fall is slowed.
	Place open milkweed pod or dandelion in front of fan. Discuss how these seeds would move outside. Bring some outside on a breezy day.

Objective	*Activity*
	Place a balloon on a desk. Put a book on the balloon. Blow up balloon and note what happens to book. After deflating a basketball, place a shallow box over it, keeping the valve exposed. Invite child to sit on box, keeping feet on floor. Pump air into the basketball and the child will be lifted off the floor.
	Air has weight. Inflate 2 balloons. Tie each of the balloons to opposite ends of same string. Hang these evenly over a stick. Pupils puncture one balloon. Ask why the one that is still filled with air is the end that drops. Use balance scale. Place deflated balloon on one side and large inflated balloon on other. Observe and discuss results.
To identify the breathing process	Man's dependence upon air. Have each child breathe deeply to feel the air pushing out and expanding his lungs. Have pupils describe the process. Take chest measurements before and after inhaling. Blow up a balloon. Air fills a balloon in much the same way as it fills your lungs.
LIVING THINGS To identify and compare properties of living organisms	Display a plant and a small animal in its container. Have the children identify and compare the characteristics of each living organism.
To identify characteristics of living and non-living objects. To compare and contrast properties of living and non-living things	Display pictures of both living and non-living objects. Have the children compare the properties of the pictured objects and then sort the pictures into living and non-living categories.
	Place some familiar examples of living things into bags; such as a leaf, a feather, lambswool, etc. Children reach into the bags and feel the various items. They then try to guess what items are in the bags and relate them to the various plants and animals from which they came.

Objective	*Activity*
To identify living things and their habitats	Take a walk in the school area and look for living things. What types of habitats were seen?
To identify living organisms through the use of the senses	Take a trip in the vicinity of the school to look for living things. Observations are to be made through the use of the senses. Examples are: Listen for animal sounds, feel the bark of two different trees, look at the shapes of leaves from different trees, look at the colors of birds and insects, smell different kinds of flowers.
To compare and contrast seasonal changes in the immediate school area	Take seasonal trips to observe changes which take place during different times of the year.
To identify the pictured habitats. To list the various organisms which could live in each habitat	Show pictures depicting different types of habitats. Have the children identify the animals that would be able to live in each habitat. Discuss importance of plant life to animal life within each habitat.
To identify living things. To differentiate between plants and animals.	Ask the children to bring to school pictures of living things. Then have them sort and classify their pictures as plants or animals.
To identify and compare the various types of animal homes	Have the children collect pictures of animal homes. Real birds' nests and abandoned hornet nests may also be brought in. Have the children identify and compare the various habitats.
To identify baby animals To recognize that each animal reproduces its own kind	Many baby animals resemble their parents. Adult animal pictures and baby animal pictures could be displayed with pupils being asked to sort these in pairs. Have pupils compare the pictures of baby animals and their parents and identify the similarities and/or differences.
To identify and compare animals. To identify similarities and differences in animals	Display pictures of many different kinds of animals (SVE pet, zoo, farm, and wild animals study prints are excellent). Have the children compare these animals and identify the similarities and differences.

Objective	*Activity*
To observe that animals have different sizes, shapes, colors, and coverings	Sort animals from largest to smallest after nature walk or trip to zoo. Sort by coloring. How does color help to protect? Look at pictures of polar bear, giraffe, etc., in natural habitat.
To classify	Discuss coverings—scales, fur, shell, etc., and sort animals according to covering. Discuss how coverings protect.
	How do animals move? Sort animal pictures according to method of locomotion; flying, swimming, walking, crawling.
SEEDS AND PLANTS To identify and compare germination and growth patterns	Germinate lima beans on moist cotton between glass panels. Have the pupils observe the formation of roots and leaves and plant growth. Sprinkle bird seed over a plastic sponge. Place the bottom of the sponge in water. Observe the resulting variety of roots and leaves.
	Using toothpicks to hold it in place, put an avocado pit in the mouth of a jar. Keep the rounded root end in water. Watch for it to sprout.
	Cut off the top of a carrot and place it in a saucer of water. Observe the new growth.
	Place toothpicks in each side of a potato and suspend it in a glass. Pour water in the glass to cover the lower part of the potato, having at least two "eyes" submerged. Observe the new growth.
	Plant radishes or some other fast-growing vegetable seed. Observe the growth pattern. When the radishes are fully grown, they can be eaten by the children.
	Bring into the classroom some soil from a garden, the woods, or a meadow. Keep it watered. Observe what happens. Have the children identify the material that was present in the soil when it was brought into the classroom.

Objective	*Activity*
	Make a collection of seeds. Collect and display pictures of the plants which grow from these seeds. Just before Hallowe'en, have each child draw a face on his own pumpkin. Then cut the tops off each pumpkin and ask the pupils to scoop out the seeds. The pre-marked faces may now be cut if desired. The pumpkin seeds are to be saved, dried, and planted in the late winter. In spring, the new plants may be taken home and transplanted. Charts depicting the cycle from seed to plant to fruit to seed should then be made and discussed. Plan a school garden. Plant bulbs in the fall and flower or vegetable seeds in the spring. Seeds may also be planted indoors in suitable containers any time during the year. Observe and compare the various patterns of growth.
To compare and contrast different types of seeds in foods. Sometimes seeds are eaten, and sometimes they are discarded.	Collect nuts and bring them to school. Crack open the nuts and observe the inside portions. Eat the nutmeats. Bring a variety of fruits to school such as apples, grapes, peaches, etc. Cut open the fruit and observe the various kinds of seeds. Eat the fruit. We sometimes eat the seed coverings and then throw away the seeds.
To identify and compare different types of seeds and the ways in which they are scattered	Make a collection of the various types of seeds. Have the children identify and compare the various ways in which they are scattered. Examples: a) maple—winglike; it sails through the air b) dandelion—fluffy; it also sails through the air c) burdock—it is carried about; it sticks to animal fur and clothing d) pea—the pods burst open
To compare different types of potted plants	Collect various potted plants and bring them into the classroom. Compare the different varieties.

Objective	*Activity*
	Provide fresh leafy celery stalks. Cut ½" off the bottom of each stalk. Place the lower part of the stalk into a container of water colored with food coloring. Observe the stalk every half hour. After a few hours, cut off sections of the stem to show coloring. Continue this demonstration until the leaves become colored, showing the vital role of the stem in carrying food and water from the soil to other parts of the plant.
To identify the needs of living organisms—plants	Place two plants in front of a window. Water one plant regularly, but deprive the second plant of water. Observe and compare the two plants. What has happened to the plant which was deprived of water? Identify the needs of plants. Obtain two plants. Place one plant in front of a window, and put the second plant in a closet. Water both plants regularly. Observe and compare the two plants. What happens when a plant is deprived of sunlight? Identify the needs of plants.
To identify and compare leaves	Collect and compare leaf samples from the different trees in the school yard. In the fall, colored leaves may be collected.
To identify characteristics of fallen leaves	Play in the fallen leaves. Observe and identify the characteristics of fall leaves. They are dry and brittle, they rustle when walked through. They crinkle and crumple and even break when handled.
To observe growth patterns when twigs are placed in water	In early spring, twigs from various trees and bushes may be brought into the classroom. Place these twigs in water to force budding.
ORGANISMS AND HABITATS To identify and compare the relationships between living organisms and their habitats	Set up an aquarium. It can be stocked with native fish or tropical fish. Children can observe the movements, habits, and other characteristics of fish—also the balance in nature and the cycle of life. Make a simple woodland terrarium. Include a small container of water

Objective	*Activity*
	and some small animals such as: a frog, a toad, a salamander, or a land snail. A small harmless snake might also be kept in a terrarium. Have the children observe and compare the habits, movements and other characteristics of the animals in the terrarium. Provide an ant observation nest. (See details on how to make at end of science section.)
To identify and compare habits, movements and characteristics of different insects	Make an insect cage to provide a place to observe such insects as caterpillars, crickets, praying mantes, spiders, and grasshoppers. Such a cage can be fashioned out of wire screening and a coffee can.
To identify habits, movement and other characteristics of turtles	Set up a turtle bowl. The children can observe how turtles move in water and on land. They can identify and list its habits and other characteristics. They can note its structure.
To identify the growth and development pattern in frogs. To identify the relationship between a living organism and its habitat	Collect frogs' eggs. Observe the development and growth from egg to tadpole to frog. Stress the need for using pond water rather than tap water.
To identify and compare habits, movements, and other characteristics of animals	Certain small animals may be kept in the classroom for observation purposes. Examples—rabbits, hamsters, gerbils, white mice. Children might be asked to bring in their own pets at designated times.
To identify and compare birds and their movements, habits, characteristics, and nests	Identify and compare the common birds found in the area. Find the nesting sites of various birds. Identify the materials used in building birds' nests. Collect and compare deserted nests. Set out bird houses where they can be seen from your windows.

Objective	*Activity*
	In winter, set out bird feeding stations that can be seen by the pupils. Mix peanut butter, bird seed, cereals, bread, suet, and sunflower seeds. Pack around pine cones and hang out for birds.
To observe life cycle—that life comes from pre-existing life, that each living thing reproduces its own kind, that all living things eventually die	Observation of birth in the aquarium. Observation of eggs hatching in incubator. Discussion of fact that each child began life growing inside his mother. Observe death in aquarium. Discuss death as inevitable to all living things. Have picture of people at various ages. Have pupils arrange these sequentially according to chronological age.
To observe different types of homes of living things	Discuss animals who build their own homes; e.g., wasp nest, bird nest, ant hill, etc. What types of homes do we build or provide for animals; e.g., dog house, aquarium, barn, cage, etc.?
To discuss eating habits of animals and to note that all animals are dependent upon plant life	List pets and food they eat. Sort according to whether they eat other animals or plant foods, or both. Investigate habits of wild animals. How are animals which eat other animals dependent on plant life?
To recognize interdependence of living things	Observe bubbles rising from aquarium. Discuss fact that plants give off air (gas) used by fish and vice versa. Fish also hide in plants and lay eggs there. (Direct observation to this.)
MECHANICAL FORCES AND DEVICES Simple Machines	
To learn that machines make work easier and/or faster	"I spy." I spy a machine in our room. After children identify machines in room, ask why we might have them. Art—torn paper picture. After finished discuss degree of difficulty. What machine usually helps us? Bring out that scissors is machine because it helps us do work.

Objective	*Activity*
To learn how machines are used in school	Custodian might show children dolly, wheelbarrow, hoist, ramp for unloading supplies, and how they work.
To learn how machines are used every day to build community	Visit construction site. Identify machines and their purpose. Bring out that they make work easier and faster.
To compare the amount of effort expended with and without the use of mechanical devices	1) Lever. Ask a child to pry open a can of cocoa with his fingers. Now give a screwdriver to the child. Ask him to perform the same task with the aid of the screwdriver. He will discover that it is much easier to open the cocoa can with the screwdriver used as a lever. Explain that part of our body is a lever. Put forearm on desk. Place book on hand. Hold wrist rigid and lift book. Swing a bat. Sweep floor. Row a boat. Ride seesaw. Discuss these machines as levers. Bring in surprise for children in box with lid nailed. Say they may see surprise, but they must first open box. Let them use hands first. Introduce crowbar. Ask "How might we use this?" Later — "What does this crowbar, which is called lever, move? Which way?" Bring out that lever is machine that helps us move things and do work. Put on science table general types of levers—scissors, nut cracker, hammer, plus objects with which they can be used. When many children have experimented with them, ask how these things are like the crowbar. Bring out that these, too, are levers. Have 2 children compete in shoveling sand or snow. One uses a shovel and the other his hands to show that the shovel can accomplish more in a set period of time. Remove a nail from wood. Try fingers and then claw of hammer. Remove spikes from wood. Try fingers, hammer and pliers.

Objective	*Activity*
	2) Friction. Friction makes work more difficult. Friction can be reduced by: a) Lubricating. Have children rub hands together. Notice heat thus produced. Put vegetable oil on hands. Note difference. b) Use of roller. Push books across table. Then place pile of books on several pencils and move. Note difference in ease of movement.
	3) Fulcrum. Have different-sized children take turns on a seesaw having a fulcrum in the center. Now move the fulcrum to another position and observe what happens. The fulcrum on a seesaw may be moved to a different position to enable children of different sizes to have a more balanced ride.
	4) Screw. Provide a brace and bit at the workbench. Ask a child to try to push in the bit. Now have him screw it in along the threads. He will discover that he can screw it in with very little effort. Let the children place screws in pieces of wood to identify the advantages of using screws.
	5) Inclined Plane. Have a child try to lift a heavy object directly up onto a box. Then support one end of a yard-long board on the box. Now ask the child to try to push the heavy object selected up the inclined plane. The children will find an inclined plane very useful in lifting heavy objects. Make inclined planes in block corner for trucks to go up and down. Use playground slide. Point out that this is an inclined plane. On science table place wood hammer, two types of nails; one with wedge, one flat. Later ask children which type was easier to pound—why? Try stitchery with two types of needles—one with point, one without. Discuss which type is easier to use. Bring out that point is called wedge and it is a machine.

In water table, blindfold child, give him boat with directions to discover which end is front without feeling to discover this. Let him push boat through water. What end is easier to push through water? Why? The way end is shaped is called wedge.

6) Wheel and Axle. A screwdriver is an illustration of the wheel and axle. Have one child try to prevent the shank of a screwdriver from turning while another child tries to turn the handle. The child turning the handle will win. Now drive a screw part way into a piece of wood. Ask a child to try to remove it with his fingers. It will be impossible for him to do this. But the screw can easily be removed with a screwdriver. Let the children practice driving and drawing screws with different-sized screwdrivers.

Ask child to give another child ride in wagon, but have wagon turned upside down. Ask if this was an easy job. Why not? Now have child do the same job, but turn wagon right-side up.
Use pencil sharpeners, ice cream freezer, etc.
Construct a windlass, a hoisting machine which utilizes wheel and axle.

7) Gears. Many eggbeaters contain gears. Have children count the number of times the beater goes around while turning the crank handle only once. Turn a bicycle upside down on the floor. Point out the gears and chain. Turn the pedals of the bicycle by hand. Ask the children to watch the rear wheel as the pedals go around. They will discover that the rear wheel goes around several times for each turn of the pedal wheel.
Observe movement of gears in Judy Clock.

8) Pulleys. Ask a child to attempt to lift a basket of blocks. Fasten a pulley to a hook above the chalkboard. Thread some stout twine through the pulley. Tie one end of the rope to the basket. Have a child raise the basket by pulling down on the other end of the twine. Explain that pulling down on one end of the rope makes the wheel turn and the basket go up.

Make pulley clothesline for classroom on which to hang paintings. Watch flag being raised outside school. Give pupils turns to hoist flag. Build tower out of large blocks. Discuss how much more difficult it becomes to lift blocks as tower grows. Introduce pulley—how might we use this to help us do work? Bring out, as children use pulley, that it is a machine because it helps us do work and move things.

9) Wheels. Have a child try to move a heavy box of blocks. Now place the same box of blocks on a truck or a wagon. The children will discover that it is much easier to move a heavy load when it is placed on wheels.

ANT FARM

Make an ant farm in a glass jar. This study and observation will serve as basis of general study of insects. (Note 3-part body.)

Fill one gallon jar with soil. Find an ant colony in area. Dig up the colony. Cover jar with dark paper to encourage tunneling. Place sponge containing honey and water at soil line. Keep jar in pan of water so that ants will not escape if lid is removed and not replaced.

Observe tunnels daily. Note habits. Ants are social insects and share food and home with each other. Note division of labor: workers, males, queen.

Social Science Program in Kindergarten

The social science curriculum used in the kindergarten program is based on the Greater Cleveland Program used throughout the elementary grades in Amherst. The GCSSP program is a concept-oriented approach which integrates a number of disciplines: history, geography, economics, political science, sociology, anthropology and philosophy. The first half of the year includes a study of the school as a social institution, the study of self, including knowledge of senses, thought processes and emotions, a study of the family and the home with emphasis on various roles, the study of the way a family buys goods and services.

Because the Greater Cleveland Social Science Program includes far more suggested activities than could possibly be experienced during the school year, and because during Amherst's first year of operation of a full-time kindergarten little need was felt to supplement the program, listing of specific activities are not included in this guide. A listing of objectives taken directly from the GCSSP follows and the teacher is referred to that guide for specific learning opportunities.

Volume I—The Child Begins to Know His World

Unit I—Learning About My School

A. People in My School
   Objectives:
   1. to adjust to school
   2. to learn about classmates
   3. to learn about the teacher and the school helpers and work they do
   4. to find our way around the school building
   5. to help by dividing up the work

B. Skills We Learn in School
   Objectives:
   1. to tell left from right
   2. to learn colors and to classify
   3. to learn physical skills
   4. to care for personal possessions

C. Learning About Rules
   Objectives:
   1. to learn what a rule is and why we need rules
   2. to learn and use rules for working and playing together
   3. to learn and use rules of health
   4. to learn and use rules of safety

Unit II—Learning About Myself

A. Learning About My Senses
   Objectives:
   1. to learn the five senses
   2. to make discrimination using each of the five senses

B. Learning to Improve My Thinking
   Objectives:
   1. to improve memory
   2. to decide what is fair for all
   3. to follow rules
   4. to listen
   5. to be polite

C. Learning About My Feelings
   Objectives:
   1. to learn about the feeling of happiness and how it helps us
   2. to learn that happiness comes in many ways and from giving as well as receiving
   3. to learn that everyone experiences different feelings
   4. to learn that anger is a normal feeling, to learn to control anger
   5. to learn how to channel feelings of anger in a positive way
   6. to learn that fear is a normal and valuable feeling
   7. to learn to control fear
   8. to learn that fear is helpful when it reminds us to protect ourselves and others
   9. to learn the connection between facial expressions and emotions
   10. to learn to take a causal approach to behavior (to learn to think of possible causes of certain feelings and actions)
   11. to learn that talking over our problems can help us

Unit III—Learning About My Family and My Home

A. My Family and My Place In It
   Objectives:
   1. to learn what a family is
   2. to learn about change in the family
   3. to learn about the child's role in the family

B. Roles of the Members of the Family
   Objectives:
   1. to identify parents' role in family
   2. to identify need for rules, decision-making and authority in the family
   3. to identify the family as a cooperative unit — working, playing, deciding together

C. The Basic Needs of the Family
   Objectives:

    1. to identify basic family needs: food, clothing, shelter
    2. to identify psychic needs of the family

Unit IV—Learning How My Family Buys Goods and Service

- A. How My Family Buys Goods
  Objectives:
    1. to identify different kinds of stores (food, clothing, hardware, etc.)
    2. to identify shopping center, supermarkets, and department stores and the need for each
- B. How My Family Buys Services
  Objectives:
    1. to learn the difference between goods and services
    2. to differentiate between private and public services
    3. to identify services provided by various people, agencies, etc.
    4. to learn how families can receive services

Volume IIA and Volume IIB and Nigerian Supplement

Unit I—The Globe—A Model of the Earth

- A. The Shape of the Earth
  Objectives:
    1. to identify spheres and to understand that the earth is a huge sphere
    2. to recognize a globe and to identify the globe as a small model of the earth
- B. Land and Water Areas on the Earth
  Objectives:
    1. to learn that earth is composed of land and water
    2. to use globe to discover that there is much more water than land on the earth
    3. to understand that people live on land, to locate various places on the globe

Unit II—Children in Other Lands

- A. Countries to be studied
    1. Japan
    2. Mexico
    3. England
    4. Swedish Lapland
    5. American Samoa
    6. Nigeria
- B. Major Concepts for Children in Other Lands
    1. A nation, as a political body of people, occupies a particular geographic location that is distinguished by both natural and cultural features.
    2. The learned behavior traits or social patterns of a society influence the activities and development of its members.
    3. The members of a society learn and adjust its culture pattern—which is the result of a mixture of values, ideas, traditions, habits, and institutions.
    4. Ethical and religious values are important; they include: belief about God and man's relation to God, justice, freedom, love or charity, generosity, courage, loyalty, self-control, truth, honesty, kindness. There are also negative aspects of values, as when we condemn cowardice, falsehood, laziness, or dishonesty.

"The dignity of each human being is a central value of our civilization and culture. We believe it to be a universal value.

The family needs food, clothing, and shelter in order to maintain life. To satisfy these needs, each member of a family plays a designated economic role.

All human beings have feelings, emotions, and desires that influence behavior. Understanding our own natures should help us to learn how to get on with other people.

Laws or rules are necessary in a community. They are both conventional and normative."[13]

Physical Education

Physical education is an integral part of the total educational program because it is especially important that a child learn to perceive and understand his own body in order to manipulate and control his environment. The courage, confidence and satisfaction that follow mastery of one's own body give a child a feeling of total well-being and adequacy as a person. The physical education program for kindergarten is carefully planned to fit the age characteristics and developmental needs of 5-6 year old children. The following growth and development characteristics are presented in relation to their physical activity needs to indicate how the physical education program can enhance children's growth and learning.

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[13] p. 18, *Greater Cleveland Social Studies Program*, Volume IIA—Children in Other Lands

AGE CHARACTERISTICS

Characteristics	*Needs*
1. Structural growth, particularly muscle masses, rapid at the beginning and slowing down at the end of this period. Large muscles (trunk, legs and arms) more developed than smaller muscles (hands and feet).	1. Big muscle activities which involve many parts of the body, such as running, hopping, jumping, throwing, hanging, rolling, chinning, pushing and pulling, to help large muscles development keep pace with structural development; also, manipulative activities involving differing objects to help the development of smaller muscles.
2. Coordination developing slowly. Gross movement skills becoming more refined; manipulative skills unrefined but improving. May be great variation from child to child.	2. Varied opportunity to practice skills of body control, such as balancing, self-testing and fitness activities and locomotor movements.
3. Extremely active and enjoy total body movement, seldom admitting fatigue.	3. Vigorous activities of short duration. More locomotor than non-locomotor skills. Encouragement to rest when tired.
4. Heart and lungs small in proportion to height and weight.	4. Large muscle activities followed by rest or change of pace.
5. Generally farsighted; unable to focus quickly or accurately.	5. Activities using large equipment and stationary targets.
6. Dramatic, imaginative, curious, imitative.	6. Creative rhythms, games and singing games which provide opportunity to pretend, create, explore, imitate, experiment and dramatize.
7. Very responsive to rhythmic sounds.	7. Opportunity to respond to percussive and musical accompaniment.
8. Individualistic, egocentric and possessive. Not ready for sustained cooperation.	8. Opportunity to perform individually on own equipment and adequate time for practice. Also need informal group activities, such as games, which provide for taking turns, sharing, development of courage and learning rules.
9. Attention span very short; interest in a multitude of things.	9. Many different activities with frequent changes; simple directions.
10. Great variation in emotional and social reaction and expression.	10. Secure atmosphere; activities which are meaningful, challenging, pleasurable, safe, interrelated with school program and which provide opportunity for recognizable success.

Objectives

Physical education is the subject in the kindergarten curriculum in which learning of neuromuscular, intellectual and social skills and concepts, and value systems are taught through the medium of movement. The objectives of physical education are those of general education; however, since it is the only subject in the curriculum solely responsible for the child's physical development, the primary objective is to help each child develop proficiency in movement skills at this age because the development of a well-integrated, fully functioning child is highly dependent upon the development of motor or movement perceptions and skills.

The objectives of the program are for each child to develop:

— optimum physical strength, endurance and organic vigor.

— perceptual-motor ability for effective, efficient performance of movement skills.

- a sense of relaxation and the release from tension.
- physical and mental coordination.
- skills of and attitudes toward physical activity as a purposeful part of daily living.
- creativity, adaptability and ingenuity in coping with new and varied situations.
- rhythmic expression in movement experiences.
- self-knowledge, self-control and self-expression.
- knowledge about a wide variety of movement experiences.
- courage, confidence and a sense of cooperation.
- clear concepts about his environment.

Basic Movement

Children love to move and need to move to grow. Many skills are introduced and practiced during the school year, for the 5-6 year olds are willing to repeat and are eager to use these skills in activities. Kindergarten is an excellent time to lay the foundation for the skills of sports, games, gymnastics and dance, but it is very important that children be permitted and encouraged to move for the sheer joy of moving and because they are built for movement.

Activities are carefully chosen so the rhythmical, well-balanced, spontaneous, uninhibited movements of young children are perpetuated or introduced and refined. Through varied experiences children improve their skills and coordination as they mature physically, mentally and socially. Confidence in movement is gained as children learn to understand and adapt to space, to large and small equipment, to other children and to the problem of learning how their bodies move and what factors affect this movement. Childhood is the time ~~to~~ learn and practice these skills, for they are fundamental to daily living.

The largest portion of time is devoted to the exploration, acquisition and practice of these skills which are fundamental to games, sports, dance and gymnastic activities.

There are two general types of movement skills: locomotor, in which the entire body moves through space; and axial, or non-locomotor, in which parts of the body move around each other.

A. *Basic Concepts*

It is important for children to learn about the factors which affect movement.

1. Movement of their bodies.
2. Time, space, force, flow
   Concepts of fast and slow, acceleration and deceleration, as well as the elements of rhythm, tempo, accent, underlying beat, rhythmic pattern, phrase, tempo, and theme are all included in an understanding of time. Movement always involves space, and space includes direction, level and range. Important concepts for children to understand, such as up-down, high-low, forward-backward, near-far, right-left are developed.

   Generating, imparting and accommodating the force of the body and/or equipment is part of the understanding of the use of body energy and the need for rest and relaxation.
3. External factors such as equipment: bats, balls, ropes. Children are fundamentally curious about things, and the need to manipulate in order to learn persists throughout the kindergarten year. Concepts of on-off, under-over, around-through are readily developed on suitable apparatus.
4. External goals
   Learning at this age is immediate and egocentric, so the concept of achievement, success or failure is important. Many activities offer tangible, visible, easily accessible goals for the child.
5. People — Learning to get along with, to share, and to take turns, is part of the thrust from home to school.

B. *Basic Movement Skills*

Locomotor

Walking
Running
Jumping
Hopping

Leaping
Galloping
Sliding
Skipping

Non-Locomotor

Swinging
Stretching
Bending
Pushing

Pulling
Turning
Twisting
Shaking

C. *Specific Activities*

The following activities use the basic movements:

Tagging
Bouncing
Catching
Chinning
Rolling
Throwing
Kicking
Batting
Striking
Hanging
Climbing
Vaulting

All pieces of small equipment can be made to move. The child learns to handle his body, utilizing all locomotor and non-locomotor patterns as he manipulates equipment. The teacher can then help him find ways to:

	Responses	*Changes*
go over	jump	jump with turn
	hop	hop, changing feet
go around	walk	change direction
go under	bounce and run	bounce, turn
go through	run (as hoop)	roll

Some children may be ready to combine equipment such as a ball and balance beam, rope and ball, ball and flight of steps. They should be encouraged to:

1. Imitate the object:	
Can you roll as it does?	Forward, backward, side roll
Can you spin as it does?	Decelerating speed
Can you bounce as it does?	Lower and faster bounces
2. Using the object:	
Can you run and beat it?	Run and turn
Find a way to get over.	Hop, jump, leap, step

Find a way to get over using your hands.	Cartwheel
Have your feet higher than your head.	Mule Kick
3. Combining locomotor and non-locomotor patterns with object.	Jumping rope and turning. Tossing ball into air and clapping hands, running under, putting part of body over

4. Combining objects. Some children will be mature enough to experiment with bouncing a ball along a balance beam, up and down a stair, under, around and over large equipment. This should be encouraged, for it helps them learn about space. These assume the nature of self-testing activities.

Apparatus and Self-Testing Activities

These activities offer the opportunity for children to gain in strength, endurance, flexibility, balance, agility and coordination. The self-testing nature permits the individual child to discover his body capabilities, to innovate movement experiences meaningful to him, to test and appraise his performance, to learn his whereaboutness, and to learn the need for practice. The individual nature helps in an understanding of individual differences of performance—makes the challenge of success consistent with individual differences of build, development, experience and interest. They are fun in action and utilize all of the basic movement skills in a vigorous and enjoyable way.

A. *Basic Concepts*

Some of the most important of these involve the awareness of the body and its position in space.

Direction
Force
Laterality
Rotary motion
Shape
Size
Up-down and Inversion
Weight support, propulsion and reception
Courage
Challenge
Perseverance
Success

B. *Apparatus Skills*

The use of large apparatus for activity at this age is becoming increasingly successful as an important inclusion in the program to meet the needs of children for large muscle activity. This includes ropes for swinging and climbing, beams for balancing, boxes for vaulting and mats for rolling and tumbling.

On the whole, 5-6 year olds like to perform close to the floor, but it is developmentally sound that they learn how high to climb, what to jump on, from, or over, and what parts of their body they can use for hanging.

Balancing
Climbing
Hanging
Jumping
Bouncing
Diving
Rolling
Sliding
Springing
Supporting
Swinging
Vaulting

C. *Apparatus Activities*

Activities requiring elements of flexibility, strength, coordination, balance and agility are both challenging and developmentally sound. It is important that children find ways to rock, roll, spin, jump and balance. Different body positions can be experimented with to find out about speed, force and space.

Problem-solving, guided discovery and exploration challenge the child to utilize a variety of apparatus such as ropes, rings, ladders, balance beams, climbers and mats in a way consistent with his developmental level. Wendy Young, a physical education major at the University of Massachusetts who worked with the children in Amherst's kindergarten during the first semester, stated that "by arranging the equipment in a new

manner for each class I found I was presenting a new challenge each day." She went on to say that "each child must invent ways and discover how to solve the problems of going over and under, around or across, on and off of the equipment... and (must) always be thinking of himself in relation to space, the apparatus and other pupils."

As a child discovers a new way to use equipment, he may demonstrate *his* solution that others may learn different ways. Thus children learn differences and similarities of movement patterns. This individualized learning experience helps to develop perseverance, self-confidence and creativity. The climbing and swinging activities are particularly important in the development of courage and the self-concept.

Suitable problems include:	Responses:	
1. Find a way to go around apparatus without touching it. Find a way to change it.	running walking tip toes on all fours sideways	skipping hopping jumping backwards
2. Show me how to get over the pieces of apparatus using only your hands. Show me how you can change it.	mule kick rabbit hop cartwheel	
3. How many pieces of apparatus can you go over and under? How many ways can you find to go under?	crawl creep roll twist turn jump and roll	dive crab walk wiggle squizzle slither step and jump
4. Can you find a way to get on and a different way to get off?		

Many word concepts can be developed while the use of the body is being explored. On, off, around, through, over, across. Relationships are also developed.

Can you go over with your feet
higher than your head?

Can you move your feet and your
hands? One foot, then one hand?

cartwheel
mule kick
roll

Rhythmic Activities

Children are inherently rhythmical and love to move to accompaniment. Rhythmic activities, or dance, serve children in many important ways. They help in the development and understanding of coordinated movement patterns, serve as a medium of expression, provide for the stimulation of creativity and perpetuate the art forms of our cultural heritage.

A. *Basic Concepts*

- a. Patterns
  - Body patterns in space
  - Movement patterns
  - Rhythmic patterns
- b. Rhythmic understandings
  - Pulse beat
  - Accents
  - Phrasing
  - Tempo
  - Time
  - Theme

B. *Basic Movements*

All movements are rhythmical movements. They should, however, be rather well developed before they are set to rhythm. The basic movements of section one may be combined into rhythmic patterns and dance forms. Since it takes a long time to perfect the skills of movement and since children tend to lose interest in an activity which requires too much practice, rhythmic accompaniment serves to offer variety to the program. A well balanced program, based on a progression of skill development, holds their interest and promotes the desired outcomes. These are usually activities which all children perform together but not necessarily in the same way.

Running, and all locomotor and non-locomotor skills
Bouncing balls, jumping ropes, tossing bean bags
Fitness activities

C. *Creative Rhythms*

Rhythmic movement is a means of expressing and communicating ideas and feelings, both of which are extremely important to children of this age.

Characters	Animals, people, fictional
Emotions	Joy, sadness, anger, fear, freedom
Songs	"The Twelve Days of Christmas"
Descriptive words	Blast off, twirl, melt, freeze
Sounds	Boom, bang, pop
Poems	"Who Has Seen the Wind?"
Designs and forms	Square, crooked, symmetrical
Chants	"Round and Round We Go"
Jingles	"Jack Be Nimble"
Holidays	"Spooky, Spooky, Black Cat"
Stories	Going to Grandmother's at Thanksgiving
Names	Raggedy Ann or Andy

See language arts and music sections for other activities of this type.

D. *Musical Games or Action Songs*

Fundamental movements may be incorporated into musical or singing games in a variety of ways which children love. Concepts of right and left may be developed. The history of the game should be included.

a. *Activities in which children perform alone*
All moving the same way at the same time
The Mulberry Bush
Looby Loo
Little Polly Flanders
Did You Ever See a Lassie?
Ride a Cock Horse

Some moving differently from the others

I'm Very, Very Tall
London Bridge
Pop Goes the Weasel
A-Tisket, A-Tasket
Charlie Over the Water

b. *Activities with partners*
Some having partners
Will You Come Walk With Me?
The Muffin Man
Rig-A-Jig-Jig
Round and Round the Village
Let Your Feet Go Tramp

All having partners

Little Miss Muffet
A-Hunting We Will Go
Hickory, Dickory, Dock
Bridge of Avignon
Ach, Ja!

Games

Children love games. The elements of daring and challenge, rules, getting caught, skill, surprise, cooperation, competition, and the extension of friendship are important contributions to the physical education program. When games are carefully selected to meet the specific developmental needs of the children, they provide an excellent opportunity for the understanding and practice of both physical, emotional and social skills, successful performance, change of pace, release from tension, and for sheer enjoyment. There are many ways of presenting skills, resting and relaxing which make learning fun and meaningful. Above all, games help children develop acceptable attitudes, habits and skills for working, playing and living with others.

Group games help the child to understand and follow directions, to participate in activities involving gross motor skills, and to gain a specific goal or objective.

Rules, which give emotional structure, should be simple.

Goals, which give intellectual structure, should be clear and appropriate.

Boundaries, which give physical structure, should be evident.

Formations, which give social structure, should be meaningful.

Because children of this age are essentially egocentric and in the formative years of skill acquisition, it is important to spend more time refining these skills than using them in games. They need to spend lots of time manipulating a great variety of equipment such as balls, ropes, rings, hoops as they move. Games are a place to try out the skills. The creative teacher will help children invent games by letting them choose, or giving them some piece of equipment which can be used alone or with a partner. Make up a game to tie in with an event of the day.

A. *Basic Concepts*
Fleeing, evading
Protecting, defending
Catching, tagging, pursuing
Directions, control, rules
Besting, losing, winning
Challenge, goals, purpose
Boundaries, formations, organization
Listening, obeying, sequences
Consequences, success

B. *Basic Skills*

The basic movement skills are used singly or in combinations for all games. Running, dodging, chasing, catching, throwing and striking become important for the purpose to which they are now put. Games for kindergarten must involve few or simple rules and utilize simple basic skills. The equipment must be carefully selected according to the needs, interests and abilities of the children.

C. *Suggested Activities*

Many games are played the world over, hence can teach much of the culture and play habits of other children. The names may vary but the fun and intent remain the same.

Simon Says
Follow the Leader
Find a Place
Giant Steps
Red Light
Tunnel Ball
Pass It Around
Circle Toss Ball
Spud
Call Ball

Detailed description of other suitable games follows.

See mathematics section for additional games or ways of making games meaningful. (e.g. number line activities, counting games)

A variety of responses should be anticipated as the games proceed. A shy child may not wish to be IT, children may wish to be caught. Rules should be varied simply for increasing interest or in relation to responses elicited. Sometimes repetition of rules will be required when a child runs before the signal, runs in the wrong direction, etc. A few sample games follow:

Circle Boundary Games

Frog in Pond

All children make a circle and drop hands. A frog is chosen. Children start walking in circle around pond. As they walk, they say:

Once there was a little frog
He went around and around
He jumped up once; he jumped up twice,
And caught a great big fly.

On the word "fly," children run to designated safe area. Those caught become frogs and game continues.

Variations: Change animal and type of locomotor activity as children go around the edge of the pond.

Run for Your Supper

A circle is formed. One child is chosen to be IT. He walks around the circle and places an object (an eraser, beanbag, etc.) between two players and calls "Run for your supper." The two players run in opposite directions to return to spot. Player who reaches vacant spot first is IT for next game.

Cat and Rat

Players form a circle. Rat is inside of circle. Cat is outside. Cat says "I am the cat." Rat says "I am the rat." Cat says "I will catch you." Rat says "You cannot." Whereupon, cat chases rat in and out of circle with players assisting rat by raising arms and hindering cat by lowering them.

Variations: Add two cats or change characters (dog and cat, cowboy and cow, witch and goblin).

Single-Line Boundary Games

Policeman—Stop and Go—Green Light—Go

Policeman stands at one end of room. Children are on line at the other end. He may either call the "stop" and "go" directions or hold up a red card or a green card. First child to cross line becomes policeman.

Variations: Policeman may use hand signals. Policeman may tell children what method of locomotion to use. Animal walks could be utilized.

Midnight

Draw two lines 30 to 50 feet apart. One player, the Fox, stands on one line. All the other players, the sheep, stand on the other line. The sheep begin to move toward the fox, calling out one at a time "What time is it, Mr. Fox?" The sheep continue to advance as the fox makes various responses such as "Two o'clock," "Six o'clock," etc. When the fox replies "Midnight," the sheep run back to the sheepfold. If the fox tags any sheep on the return run, they return to the Fox Den to assist him. The last sheep to be caught is the fox next time.

Games Using Entire Area

Ocean is Rough

Players in pairs are scattered around play area. Each couple draws a circle around its position, joins hands, and chooses the name of a fish. A few extra players are called Sharks. The sharks stand in the center of the play area holding hands. On signal, the sharks, still holding hands, walk around calling the names of fish. When couples hear their fish name called, they join sharks. When sharks can think of no more fish, they call "The ocean is rough," and all run for circle. The couple without a circle must be sharks for next game.

Squirrel in Tree

Children in pairs form hollow tree. A third child stands inside each tree and is a squirrel. One "squirrel" has no tree. At a given signal "squirrels" must change trees and extra squirrel hurries to find a tree. After several repetitions, exchange "squirrel" and "tree" roles.

Follow the Leader

Divide class into groups of 4-6 children. First one in each line is leader. Followers must imitate everything he does. At a given signal, such as whistle, the leaders move to the end of the line and a new leader begins.

Art

Art is an important means of discovering materials and textures, of experimenting with color, and providing for self-expression. The teacher must be mindful of the fact that it is the process, the involvement of the child, that constitutes a worthwhile art experience, rather than the product itself. A pre-determined product robs the child of all creativity. The teacher should refrain from making comments about a child's art work which would tend to increase uniformity of products. The child who paints a cow green should not be asked, "But are cows really green?" It may be the total greenness of the pasture and trees that has led to this interpretation, or it may be something else incomprehensible to the adult, but meaningful to the child. Evelyn Pitcher says in her book, *Helping Young Children Learn,* that "there is a relationship between his marks on a surface and his thoughts. He will draw that which he feels and thinks, not that which actually exists. He will unconsciously enlarge, distort, and change objects according to how important they are to him."* The teacher should never encourage changes in an art product to contribute to greater realism, for in doing so she would inhibit creativity by teaching the "right" way to draw a picture.

Occasionally a child will express dissatisfaction with a product because it lacks the realism that *he* desires. The teacher then might give assistance by asking the child pertinent questions or by guiding him in careful observation. For instance, if a child wants to draw an elephant and says he is having difficulty, the teacher might ask him questions about size, shape, color, etc. It might be necessary to go to a resource book to look at pictures of elephants.

After careful discussion the picture should be removed prior to the child's beginning his painting. Never should the teacher give direct assistance by "helping" the child work on his paper.

A possible question on perspective might lead children to an observation of objects far and near and to the generalization that objects which are at a distance appear smaller than those which are close at hand.

**Helping Young Children Learn.* Evelyn C. Pitcher et al.

Care should be taken to see that this type of skill work arises from a need felt by the child—never one felt by the teacher. Most kindergartners, however, will not require this sort of direction if the teacher herself makes no requirement that art work be representational.

The teacher should provide a variety of art materials: tempera paint, finger paint, clay, paper of a variety of colors and textures, string, yarn, toothpicks, straws, sponges, clay, wire, boxes. Allow children to experiment with these materials to make something that is truly "their own." When a subject is suggested to the pupils, it should be a subject to which they can relate because of personal involvement with that subject.

"Take your cues from their world.

Typical topics might include:

Your house
Your family
Where you like to play
Your favorite thing to play with
An animal you know
How you feel when you are lonely
Things that scare you
Things that make you happy
A make-believe place
Shapes you like
Lines can be different from each other
The way colors make you feel."*

Avoid using dittoed pictures, coloring books or models of suggested objects, since these devices lead only to very stereotyped art work and destroy creativity.

Art activities may correlate with social studies projects, with language arts, with creative movement, and with music, or may be an experience apart from the rest of the curriculum. Art activities are always presented so that children have choices—either as to media, usage, or outcome, and all products are equally accepted whether they be realistically representational or whether they have meaning for the child alone.

Children enjoy telling stories about their art creations. These dictations, written down by the teacher, provide an excellent language arts activity and may be included in pupil language experience booklets.

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* *Helping Young Children Learn,* Pitcher et al

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The objectives of the art program are:
- to use a variety of materials and art media
- to use color in many ways
- to use varied shapes
- to express ideas or feelings about the product
- to increase creativity and self-confidence as indicated by the free selection of a variety of materials

Because the goals of the art program are more general and can be implemented in innumerable ways, specific objectives do not accompany the activities which are suggested as various media are explored. Activities are suggestive of the types which could be utilized to meet the broad goals.

Basic Activities and Media for Implementation

Painting
tempera paints
finger paints

Collage-making
cut and torn paper
cloth
cardboard
gummed material
variety of scrap material

Sculpture
clay or play dough
boxes
wire
papier-mache

Drawing
crayon
chalk (wet and dry)

Print-making
vegetable
sponge
gadget

Media and Activities

Tempera

Direct painting - Most painting will be done with large brushes and large paper on easels or table.

Dribble painting - Use a wet piece of manila paper placed on newspapers. Using a large brush, paint entire paper one color. Dribble other colors on page. Pick up paper by an end or side, allowing paint to run and blend. Children describe what they see in their paintings.

Blot painting - Put a large blot of paint in middle of a paper. Fold and open. Using crayon or other paints, make a picture out of the figures that appear.

Spatter painting - Pin pressed leaves, flowers, other objects, or shapes cut by children to paper. Dip toothbrush in diluted tempera. Rub over screen held above paper. Spatter design will be formed around object.

Straw painting - Put several dabs of paint on paper. Blow it with straws to create unusual effects.

Finger Paint - Use either commercial or homemade variety. May be used directly on paper or may be used on plastic-covered table top and then paper is placed on top. Several pupils may then use the same large source of paint and rework it for their painting. Other advantages are the larger area for working and the variety of patterns obtained.

Crayon

Crayon resist - Pupils make a crayon drawing following such questions as: Shall we make an underwater picture? An outer space picture? A snowy day picture? Use diluted tempera paint as a brush. Apply over crayon drawing.

Rubbed designs - Cut various shapes and place under manila paper or newsprint. Use unwrapped crayon scraps. Color, using the side of crayon, and designs and shapes will appear. (String may be placed in a design or shape under the paper instead.)

Crayon showings - Shave crayons. Sprinkle over a colored or plain paper. Put newsprint or another colored paper on top and run warm iron over it.

Paper batik - Draw a crayon design. Dip paper in water to soften it, then crumple. Smooth out and use a thin wash of tempera to cover it.

Folded paper design - Half of a design may be drawn on one side of a paper. Fold over. Use warm iron to duplicate design.

Crayon blending - (application of one color over another). The bottom color is applied rather heavily and the top color lightly to achieve the desired blend. Using the side of the crayon, encourage children to start at one side of the paper and gradually change to another color, so that a blending of the two colors rather than a dividing line between the two is evident. Children should be encouraged to experiment with the effect of pressing lightly as well as hard. Shapes may be cut out of these blendings and mounted (e.g., flowers, people, leaves, etc.).

Radiating color - Pupil makes a large dot of color in the center of the paper. He is encouraged to make different types of lines around this focal dot. Radiating colors may take the form of colorful, unique flowers.

Crayon stencils - Have children design and cut out their own stencils. Either part of the cut stencil may be used, and the child using the broad side of the crayon may provide background if the cutout of the design is used, or may crayon in the center portion if the remaining part of cutting is used.

Crayon on variety of textures - Encourage experimentation with a variety of textures which yield interesting effects (e.g., burlap, sandpaper, newspaper, muslin, canvas, etc.).

Chalk

Chalk - Use wet paper with dry chalk or dry paper with wet chalk. Colors may be blended, using a tissue or with fingers. A fixative should be applied. If buttermilk is used to wet the paper, the chalk does not rub off so easily when dried. Also, because of the slow drying, it gives the child more time to work the material.

Section off chalkboard and allow several children to draw on the board with colored chalk.

Collage-making - Children may tear or cut a variety of colored and textured papers. Place these on a large paper or piece of oaktag. Cloth, buttons, cardboard, bottle caps, straws, and other discard materials may be used. Assorted gummed materials may be added to the collage. This might include labels, seals, cellophane tape, gummed reinforcements, masking tape, adhesive shelving, etc.

Printing - Use a variety of fruits and vegetables which provide an interesting cross-section when cut (oranges, lemons, lettuce, cabbage, carrots, potatoes, etc.). Sponges of various sizes and textures provide very interesting print effects. Natural materials and gadget materials may also be used such as nuts, pine cones, twigs, leaves or paper clips, clothespins, cookie cutters, hair rollers, spools, keys, etc. These repeated designs may be used to make wrapping paper or greeting cards.

Sculpture - The feel of working with clay or play dough is a most delightful experience for five-year-olds, and this may be the sole medium of the sculpture or it may be combined with sticks, pipe cleaners, straws and wire. Boxes can also form the base for a three-dimensional art experience. Collect a variety of sizes, shapes. Have pupils glue them together and paint them.

Wire also is excellent because of its manipulative quality. Wire coat hangers may be opened up and used. Colorful, plastic-coated electricians' wire is excellent for this purpose.

Papier-mache provides both a worthwhile experience in making the material as well as utilizing it in a variety of art projects.

Recipes for Art Materials

Play dough

2 cups flour
1 cup salt
2 tbsps. olive oil
food coloring

Add water gradually to make a soft, pliable mixture of the proper consistency.

Modeling mixture

1 cup salt
$\frac{1}{2}$ cup cornstarch
$\frac{1}{2}$ cup boiling water

Mix in pan, stirring over low heat until too stiff to stir. Use when cool.

Flour Paste

1 cup boiling water
1 tbsp. powdered alum
1 pt. cold water
1 pt. flour
1 tsp. oil of cloves or wintergreen (optional) to add pleasant fragrance

Boil 1 cup water. Add alum. Mix flour and cold water. Gradually mix into boiling water. Cook until slightly bluish. Cool. Add fragrance if desired. Place in covered jars.

Papier-mache
Soak old newspapers. Reduce paper to pulp by stirring. Make heavy paste with flour, water, and a small amount of salt. Mix paste and paper pulp. Stir until mixture is consistency of modeling clay. Use for sculpture work by itself or over model forms such as bowls, balloons, etc. Paint when dry.

Homemade finger paint
½ cup laundry starch
1 qt. boiling water
1-½ cups soap flakes
½ cup talc (optional)
1 tbsp. poster paint or vegetable coloring

Mix starch and water to form paste. Add boiling water. Cook, stirring constantly until appearance is glossy. Add talc, if a smoother paint is desired. Let mixture cool. Add soap flakes. Stir. Store in jars.

Music

Responding to music is a pleasurable experience for young children. Rather than being relegated to a particular period only, it permeates the kindergartner's day.

Music can change the pace of things in the classroom. A soft record will quiet an overly noisy free-play period. Music can be used as a transition from one activity to another. It can be the spontaneous response of a child to his environment, or it can be contained in a lesson designed so that the five-year-old will:

increase auditory discrimination
match tones
listen with a purpose
respond rhythmically
respond with a variety of creative movements
use a variety of instruments
sing a variety of songs

"Music is for all ages.... Let it be full of joy. Let children move, invent, respond, sing, play, and discover this beautiful world of sounds and feelings."[14]

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[14] Parker, Lisa Frederick: Notes on Music and Movement for Headstart Teachers. New England Conservatory 1967

Objective	*Activity*
To increase auditory discrimination	Have children respond creatively to changes in pitch by centering their movement high or low. High movements might include movements such as trees swaying, reaching for the stars. Lower movements might be kneeling to work in a garden, or leg movement, stamping, etc. Have children curl up in a cocoon and slowly emerge and rise as pitch moves progressively upward until the butterfly flies away. (Imagery of seed sprouting and plant growing could also be used.) Children may curl up as a jack-in-the-box. They stay inside while music is low and pop out in response to a high note. Have children experiment with and discover all the sounds they can make by themselves (clapping, stamping, whistling, humming, etc.). Have children combine sounds such as sliding feet and clapping hands. Have children, using sound clues only, play "Who Am I?" and have other children guess (a whistling, hissing train; a quacking duck, etc.) Combine movement and sounds and play the same game. Have children close their eyes. Play two notes on the piano. See if they can discriminate between the higher and the lower, the louder and the softer, the longer and the shorter.
To match tones	Teacher sings names as roll is called. Child sings his name back, using same tone. Children sing answer phrases to match tone of teacher's question or greeting (e.g., Hello, Johnny - do, do, mi, mi - Hello, Miss Jones; or, Who has a yellow dress? Child answers in same tone, I have a yellow dress. Who has a cowboy hat? Some new shoes? etc.
To listen with a purpose	Teacher plays a marching beat; children must listen carefully as they march in order to respond to a change of beat, such as running. Move while the tambourine shakes; stop when it stops. Roll up in a ball on floor. Teacher "pumps up ball." Listen for the pop and respond by im-

Objective	*Activity*
	mediately "deflating." Play traffic game. Run when green card is held up. Stop on red. Listen to records such as *Sing and Do* records, and respond to the movements suggested by the record. Listen to excerpts from records or musical stories for purpose of identifying characters and animals (e.g., *Carnival of Animals* or *Peter and the Wolf.*
To respond rhythmically	(Creative movement activities suggested in language arts section could be used.) Clap various rhythm patterns. Use rhythm instruments to accompany piano. Say your name while clapping the beat. Pretend to be the wind. Use the tune Mary Had a Little Lamb with such words as "The gentle breeze is blowing me - blowing me - blowing me" or "Autumn leaves are falling down, falling down, falling down." Or to the tune Frere Jacques, sing "Wind is blowing, Wind is blowing, Kites so high, Kites so high. Tossing, rising, falling. Tossing, rising, falling, As they fly, As they fly." A variety of well known songs can be adapted to various types of creative, rhythmic movement.
To use a variety of instruments	Experiment with different instruments and the ways that the sounds can be varied. Make instruments: Decorate oatmeal boxes for drums; make a pair of sandpaper blocks by gluing sandpaper on wood, decorate the tops. Cut dowel sticks into 6" lengths, sand, and decorate. Make rattles by covering light bulbs with papier-mache, dry, hit to break bulb so that broken glass will rattle, decorate. Fill glasses to a variety of heights with water and use to experiment with pitch and play tunes. Use Orff instruments and combine with creative movement. Have a marching rhythm band.

Objective	*Activity*
To sing a variety of songs	Use adaptable songs which can serve many purposes and which include activity songs. Personal songs which relate to the child's activity (such as "Toodala") or to what he is wearing (such as "Johnny Wore His New Shoes," "Janie Wore a Yellow Dress," etc.) are especially suitable because of egocentricity of five-year-olds. Jim Along Josie is an excellent transition song—adaptable to many situations. Songs chosen should be short, melodious, rhythmic, and related to the experiences of children.

After a period of the informal type of musical activities and experiences described, some children will be ready to move into a more sequential program of skill developments.

*The following conceptual learnings will stimulate the children to:

imitate
explore
discover
recognize
identify

differentiate
verbalize
memorize
recall
evaluate

MELODY

Promote the development of aural awareness leading to recognition of:
- —phrase length
- —higher and lower pitches
- —ascending and descending melodic direction (up and down)
- —relationship of a melody to its tonal center (1 or do)

RHYTHM

Promote the development of aural awareness leading to a bodily response to:
- —broad rhythmic flow
- —pulse (recurring beat)
- —longer and shorter duration (rhythm of the melody)

HARMONY

Promote the development of aural awareness leading to recognition of:
- —chord changes
- —tonic chord
- —mode (major or minor)

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*"The Study of Music in the Elementary School—A Conceptual Approach." Music Educators National Conference 1968.

FORM

Promote the development of aural awareness leading to recognition of:

—phrase length
—repetition of identical phrases in songs
—repetition of identical sections in larger compositions
—phrases which are completely different from others in songs
—sections which are completely different from others in larger compositions

TEMPO

Promote the development of aural awareness leading to recognition of:

—faster tempo
—slower tempo

Encourage the use of the words "faster" and "slower"

DYNAMICS

Promote the development of aural awareness leading to recognition of:

—louder sounds
—softer sounds (both environmental and musical)

Encourage the use of the words "louder" and "softer"

TONE COLOR

Promote the development of aural awareness leading to recognition of:

—individual differences in children's voices
  speaking
  singing
—characteristic sounds of simple percussion instruments
—characteristic sounds of tonal instruments: xylophones, metallophones, glockenspiels, melody bells, resonator bells, piano and autoharp
  selected orchestral instruments such as violin, flute, trumpet, and string bass

Singing: In the early singing experience of the child, songs should be sung which use only a very limited range of tones—preferably between E-E♭ above middle C and up to B♭-B or C. Rapid progress will be made at first if songs are limited to only two or three notes (sol-mi-la). In any case, the use of songs which have long skips, have accidentals, and a long range of pitch, will defeat your purpose. "Pentatonic Songs for Young Children" written for Threshold to Music is an ideal beginning song book.

Objective	*Activity*
To develop a strong feeling for beat (or pulse)	**Ask the class to move about, feeling the beat as they chant rhymes. (i.e., Hickory, Dickory, Dock; Rain, Rain, Go Away, etc.) They can feel the beat by clapping, stepping, marching, snapping, nodding, etc.** **Listen to a suitable masterpiece; have children respond as in above. (Below are a few suggestions from RCA's Adventures in Music.)** **Bach: *Suite No. 3 in D,* Gavottes No. 1 and No. 2** **Bizet: *Carmen Suite No. 2,* The Changing of the Guard** **Gluck: *Iphegenia in Aulis,* Air Gai** **Grieg: *Peer Gynt Suite No. 1,* In the Hall of the Mountain King** **Kabelevsky: *The Comediens,* Pantomine** **Mozart: *Eine Kleine Nachtmusik,* Romanze** **Prokofiev: *Summer Day Suite,* March** **Ravel: *Mother Goose Suite,* Pavane of the Sleeping Beauty** **Shostakovich: *Ballet Suite No. 1,* Pizzicato Polka** **Stravinsky: *The Firebird Suite,* Berceuse** **Thomson: *Acadian Songs and Dances,* Walking Song** **Teach songs by rote while a) clapping the beat, b) walking the beat, c) clapping and walking the beat**
To develop a strong feeling for rhythmic pattern	**Begin with a familiar rhyme such as "One, two, tie my shoe"** **a) say the words** **b) say the words and have your hands clap the exact rhythm of the words (the rhythm of the words will be the *rhythmic pattern* of the song)** **c) say the words and have your feet step the rhythmic pattern of the words (of the song)**

Objective	*Activity*
	d) say the words while having your hands and your feet sound the rhythmic pattern Sing some simple songs and include the same procedure as above.
To develop a strong feeling for rhythm pattern	Listen to quality recordings (such as those listed above under "beat"). Play a section of the recording and have children clap rhythmic pattern of the most outstanding theme (or section). Transfer the rhythmic pattern to a simple rhythm instrument such as drum, rhythm sticks, tone block, etc. As a challenge for the more gifted child, have him step the beat, while clapping the rhythmic pattern of a song as he sings.
To develop the feeling of meter or accent	While clapping and stepping the beat of a song, accent the first or strong beat of each measure by bending knee and clapping more sharply (or loudly) on the first beat of each measure. This can be done while standing in place, but is more meaningful if children can go forward in a circle or straight line. Listen to simple marches, waltzes, etc., and clap, tap or stamp the heavy beat. The children sometimes enjoy counting "1, 2, 3, 4—1, 2, 3, 4" clapping only on the "1's." Suggestions for listening: Mussorgsky: *The Promenades from Pictures from an Exhibition* Delibes: Prelude from *Sylvia* Bizet: Trompette et Tambourin from *Jeux d' Enfants* Bizet: Intermezzo (Minuetto) from L'Arlesienne
To develop the feeling for phrase	Have children sing a familiar song such as "Go In and Out the Window" "The Needle's Eye" "Oats, Peas, Beans, and Barley"

Objective	*Activity*
	Clap the beat of one phrase (i.e.) | | | | | | | | Feel the beat of the next | | | | | | | | or Clap one phrase and step the next or Boys clap first phrase, girls next or Teacher sings one phrase, children sing next *In movement*: Walk forward one phrase; backward on next or Slide right in circle for first phrase, turn in place on next or Tiptoe on first phrase; step heavier on next phrase Use various rhythm instruments. Alternate instruments as phrases change.
To create or improvise movements for songs, or recorded selections	Song "Jim Along Josie" Substitute the words "Walk Along" for "Jim Along," children participate in activity suggested by classmates such as "Jump Along Josie," "Tap Along Josie," "Snap Along Josie," "Twist Along Josie," etc. Other songs which lend themselves to above activity could be "Toodala," "Adam Had Seven Sons," etc.
To be able to sing very simple pentatonic songs.	Using hand signals, begin with the minor third "sol-mi." At chest height clap hands together, pointing fingers to the front for "sol"; let hands slap lap for descending tone "mi." Many, many other songs can be invented by the children using these two all-important tones for the first basic tonal pattern. Have children call each other by name, using descending minor third while feeling the interval with their hands. This is one of the most useful activities in developing pitch discrimination.

Objective	*Activity*
To play a simple melodic ostinato as accompaniment to songs	At first it is well to begin use of Orff instruments with a single note (in one hand or both hands). By using songs which keep within the pentatonic scale, we can create limitless interesting ostinati (repeated patterns) to accompany our songs. Example: Hot Cross Buns (these principles can be applied to any song in the pentatonic). Child plays FFFF as class sings "Hot Cross Buns—(A G F-) and continues to play same throughout song. At another time he may play (maintaining steady beat) CCCC with right hand while at the same time playing FFFF with left hand as class sings the song through. Change pattern to half notes: C-C- with right hand; F-F- with left hand. To play the half note, it helps the child to strike the note on the first beat, and cross the mallets for the second pulse of the half note. In this way, he does not rush the sustained tone. After children are able to play one single note as an accompaniment, develop a pattern with a descending or ascending scalewise pattern such as "Hot cross buns-" F G A— or F D C- or F G A C Warning: Remember to always cover or remove bars for "ti" and "fa" so that only tones in the pentatonic scale remain (do-re-mi-sol-la). Now try a reversal pattern such as: C A C A or F A F— etc.

Objective	*Activity*
	After these simple patterns are secure in the child, then more interesting rhythmic variations can be improvised on the same tonal patterns. First tonal pattern suggested was A G F—. Now "dress it up" in a more interesting rhythmic pattern; i.e., using combination of quarter and eighth notes A G FF-F or AA GG-FF-F. Using the tonal patterns suggested above, and those created by child or teacher, combine several of the patterns so you have an interesting texture of tone formed from the blending of different sounds of various instruments. Remember—limiting your songs and instrumental combinations to the use of the pentatonic scale enables you to invent endless numbers of interesting combinations.

Suggested Materials, Books, and Equipment for Music

The Study of Music in the Elementary School - a Conceptual Approach

Edited by Charles Gary
Music Educators National Conference, 1201 Sixteenth St., N.W., Washington, D.C.

Threshold to Music Program - Harper & Row, Publishers

Kindergarten Experience Chart
Kindergarten Teacher's Manual
Pentatonic Songs for Young Children - Mary Helen Richards
Hand Singing and Other Techniques

Music With Children - Grace Nash—Swartwout Enterprises, Box 476, Scottsdale, Arizona

Teacher's Manual - Preparation—Procedures
Verses and Movement
Series I

Orff-Schulwerk *Music for Children* - Associated Music Publishers, New York

I Pentatonic
Teacher's Manual by Doreen Hall

Songs to Grow On - Beatrice Landeck - Edward Marks Music Corp., New York

More Songs to Grow On - Beatrice Landeck - Edward Marks Music Corp., New York

American Folk Songs for Children - Seeger. Doubleday, Garden City, N. Y.

The Fireside Book of Songs. Simon & Schuster, N. Y.

Music, Movement and Mime for Children. Vera Gray and Rachel Percival. Oxford University Press, N.Y.

Music In Childhood Education. Robert Garretson. Appleton-Century Crofts, N.Y.

Adventures in Music - RCA Victor - Grade 1

Exploring Music Listening Lessons - Holt, Rinehart & Winston Inc., N.Y. Grade 1

This Is Rhythm with Ella Jenkins - Folkways Records

Set of quality rhythm instruments
Glockenspiels - soprano and alto
Xylophones - soprano and alto
Metallophones - soprano and alto
Hand drums - one for every other child
Timpani - 2
Record player of highest quality
Piano

Evaluation of Pupil Progress

Evaluation in the kindergarten must be an ongoing process. In this process the physical, emotional, social, and intellectual growth of the child should be carefully assessed.

Results of readiness tests, IQ tests, tests of visual perception, as well as development checklists, may be used. These results must be supplemented by the most useful and the most basic method of evaluation—detailed samplings of pupil behavior. Two types of samplings are suggested:

1. The time-sampling method. The teacher, counselor, or trained aide can record all behavior in a fifteen or twenty minute period of time. Care should be taken during the year to see that each child is observed in a variety of situations—both in free-selected activities as well as in teacher-structured lessons.
2. Anecdotal record. The teacher records short specific examples of a child's behavior which seem to reveal something significant about the child. Care must be taken to see that an

isolated, unrepeated incident is not regarded as typical behavior of a given child. Every effort to eliminate teacher bias in the selection of significant behavior should be made to insure that the anecdotes do not contain only those behaviors which support her preconceived notions of the child, but rather those which include those behaviors which are representative of the wide range of responses which a child exhibits.

Careful examination of the broad content area objectives contained in this guide will aid the teacher in her recordings of academic progress so that as the year progresses she will be able to note growth in skills and understandings in these areas. A summary statement of progress which relates specifically to these objectives will be most useful in assessment prior to entrance into grade one.

Because of the recommended interest center approach to kindergarten, it is necessary to devise some efficient method of recording where children have spent their time during free selection periods. Usually a sign-up sheet of some type is adequate. A sheet may be placed at each center, or a single large sheet may serve if children arrive in small groups or individually over a period of time and are allowed to select, upon arrival, their work area for the period. Information as to where time is spent is most useful to the teacher in assessing individual needs and interests in order that she can capitalize upon, as well as broaden, those interests.

Although observation and recording is time-consuming, it is a necessity in any program based on the establishment of individual goals for each pupil and in the adaptation of curriculum and methodology to meet individual needs.

Major Equipment
sink and lavatory in room
pupil chairs
2 rocking chairs
2 adult chairs
piano
tape recorder with listening station
file cabinet
overhead projector and stand
record player
round or trapezoid tables
rectangular work tables
tote boxes and cabinet
sand table

water table
carpeting
individual coat storage section
appliances and furnishings for housekeeping corner (play stove, refrigerator, sink, etc.)
woodworking bench
bulletin board space
storage shelves
room dividers
cooler or refrigerator
hot plate
Orff instruments
SCIS kit

Minor Equipment and Materials

rhythm band instruments
records
magnifying glass
paper cutter
scissors
paint brushes
easels
prisms
batteries
magnets
compass
egg incubator
tools for workbench
Greater Cleveland material
globe
map of U. S.
map of world
local map
road maps
American flag
hollow blocks
smaller solid blocks
assorted small trucks, cars, etc.
puppets
paper punch
rulers
yardstick
cylinder blocks
Unifix cubes
Rods (Montessori)
metal insets
large geometric solids
balance scale
aluminum liquid measures

wastebaskets
staples
flannelboard and cutouts
alphabet wall cards
blackboard erasers
easels
pencil sharpener
pitch pipe
chart stand
shears (adult size)
clock
thermometer
puzzles
lace boot
Peabody Language Development Kit
Language Lotto
sandpaper or felt letters (upper and lower case)
sandpaper or felt numerals
giant dominoes
dial phone
toy cash register
walk-on numerals
walk-on number patterns
form board
classroom abacus
small abacuses
individual pegboards
large beads and laces
enlarged U.S. coins
landscape peg sets
parquetry blocks
Ginn Readiness Kit or Children's World (Holt, Rinehart & Winston)
Frostig materials
Learning to Read Through Experience (Lee and Allen)

Testing Materials

Readiness Tests (e.g., Metropolitan)
Perceptual Tests (e.g., Frostig)
de Hirsch battery
Developmental Checklist (Mrs. Janet Spyker, school psychologist)

Supplies

pencils
staples
stapler
paste
rubber cement
modeling clay
puddings, jellos and
other simple "cooking" supplies

crayons
tempera paint
finger paint
Elmer's glue
tongue depressors
flour and salt (for play dough)
chalk (white and colored)

manila paper
oaktag
crepe paper
corrugated paper

newsprint (lined and unlined)
construction paper
metallic paper

paper plates
string
paper cups
rubber bands
transparent tape
pipe cleaners

paper bags
cotton
paper fasteners
masking tape
magic marker

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